Bell Telephone MAGAZINE

AUTUMN 1959

Data communication, a step toward the wonders of tomorrow.

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- Why we need "comparable earnings"
- "The Greatest Business Getter of Them All!"
- "The Future of Our Economy"
- "Planning For The Sixties"
- DATA-PHONE — a new service concept
- Training plant craftsmen

VOLUME XXXVIII NUMBER THREE AUTUMN 1959

Bell Telephone MAGAZINE

A non-technical review, published quarterly to give Bell System management people a broader view of the history, objectives, operations, and achievements of this business than they might attain in the course of their day-to-day occupations, and an added sense of participation in the problems and accomplishments of our nation-wide public service.

Cover: The day of the computer and of automation and the wonders they promise is dawning, bringing with it a need for swift communication between machines. The DATA-PHONE which permits machines to "talk" to machines takes us a step closer to that fabulous future. In George Samerjan's painting DATA-PHONE is shown symbolically against a background that suggests the coming space age.

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A MEDIUM OF SUGGESTION and A RECORD OF PROGRESS

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Competition, Risk—and Earnings

The following is an excerpt from President Frederick R. Kappel's recent talk before the General Assembly Meeting of the Telephone Pioneers of America in Cleveland, Ohio, in which he stressed our industry's need for earnings comparable to those of other progressive industries. As Mr. Kappel pointed out in his talk, the need for comparable earnings is not a new concept but a restatement, in the light of present and future needs of the business, of the long standing policy of providing the best possible service at the most reasonable rates consistent with good financial health. Mr. Kappel's remarks to the Pioneers give added emphasis to the report on the work of the Earnings Task Force as described in the article "Comparable Earnings" on the following pages.

"We have had a tremendous amount of growth and change since you and I came into the business, and we are surely going to see a lot more. So I'd like to talk briefly about some of the prospects and what they mean to us as telephone people."

With these words, which followed a warm greeting to the Pioneer assemblage and compliments to them on progress made toward their own objectives, Mr. Kappel went on to discuss the great opportunities that lie ahead in the telephone industry. We may well be serving 69 million households in 1957 as compared with 42 million today, he told his listeners. He went on to explain that this rise in population, plus the prospects that standards of living will continue to improve, would bring new demand not only for basic telephone service but for new and improved products and services "if we learn what people want and organize ourselves to meet those wants . . ."

In this context, Mr. Kappel warned that because we will be selling more optional services and conveniences in the years ahead our business "is bound to face more competition and more risk." He explained that more and more we will be competing with the

products and services of other industries. "To get our share of the customer's dollar we shall have to compete and compete and compete with all kinds of new customer products."

He also reminded his audience that, "when economic downturns come, and people feel like pinching pennies, they can easily ask us to remove the optional features and leave in just the basic service. Clearly, therefore, the investment we make to provide increased convenience is more risky, and it becomes all the more important that we earn enough in good times to be able to stand the gaff when the going gets harder."

"However, I think the matter of how the telephone industry ought to earn in the future goes quite a bit deeper than that. This increasing competition with other industry that I spoke of—why should we engage in it? Why should we try to come up with new ideas and instruments and systems that will serve our customers better? Why undertake new ventures? Why accept new risks?

"My own answer is that we simply must do all these things to be a progressive industry—one that makes important contributions to the economy and to society, that is well regarded by the public; and that competent, forward-looking people want to work in.

"But I also believe that certain factors which are fundamental to the progress of other businesses cannot be absent from ours. I mean specifically the profit incentive—the drive for financial progress – the expectation of reasonable reward. I admit I am prejudiced in favor of telephone people. They have many distinctive qualities and they have shown them again and again, to their own great credit and the credit of the service. Nevertheless we are not basically different from other people. Neither are telephone share owners. Neither are the people who will enter the telephone industry next year or ten years from now.

"So to do our best job, I am convinced we need to work in the same economic climate that makes for progress in private enterprise generally. To borrow a sentence from last year's A. T. & T. Annual Report, we cannot work effectively in one kind of climate while the rest of business is moving ahead in another. Particularly we cannot do so as our own business faces increasing competition and as our risks increase. And, to speak directly to the point of what we ought to earn, I will say it this way: I think telephone earnings broadly comparable with the earnings realized by other well-managed, progressive businesses in competitive industry are necessary to produce the very best in telephone service.

"Moreover, I think such earnings are necessary to enable us to provide in the long run the best service at the lowest price. Why? Because they will give investors the incentive to provide the great sums of capital we need. Because they will allow us to spend money to effect long-run economies. Because they will stimulate and spur us to use our inventiveness and energy in this competition I was talking about. Because they will encourage us to take the risks that will benefit our customers. Because they will give the business the vigor and vitality it must have to attract top-grade people who will have both the desire and the ability to make this industry of ours contribute more and more to the world. So far as the Bell System is concerned, it seems to me this view is an extension of long-standing policy. . . . "

Studies by a Task Force of Bell System executives stress the importance of public utility earnings being comparable to those of non-regulated industry

Comparable Earnings

James W. Heckman, *Assistant Vice President*
ADMINISTRATION-R DEPARTMENT, A. T. & T. CO.

"The Bell System exists to provide top flight communications service. All of the System's policies and all of its actions must be pointed in that direction. In this report we deal with the urgent need for profits. Possibly some statements in the report, taken out of context, could be misconstrued as indicating too great concern about profits.

"So, let the reader have in mind that our justification for profits is to enable the System to provide more and better service at a fair price to the American public. If we attain that primary goal, we will also bring real benefit to our employees, to our investors and to America as a whole. That better profits are needed to attain better service in the long run is clear to those of us who have worked on this task. It is equally clear to us that in the long run good profits will enable the System to provide this service at a lower price than would otherwise be possible. If we cannot justify profits for these purposes, we cannot justify profits at all. But we know, and we think we have proved, that improved profits are essential to attain our goal."

THE FOREGOING is the preface of a report, or rather a series of reports, growing out of work done in 1958 and 1959 by a task force of Bell System people. This project was undertaken in an effort to throw new light on the discrepancy in profits performance between the regulated public utilities and non-regulated industry in those inflationary years that have followed World War II.

The main task force committee consisted of five Associated Company vice presidents, representing five different departments. Many people assisted in the work, including 33 who were specifically designated as members of a number of subcommittees.

No one expected, you may be sure, that the task force would find any startling facts or panaceas in its search. So much work and thinking, both within this business and outside, have gone into this subject over the last decade that no great surprises could reasonably have been expected. What was

expected was a sifting, a fresh look as nearly uninhibited by past conclusions and thought patterns as possible, and where appropriate, new or renewed emphasis.

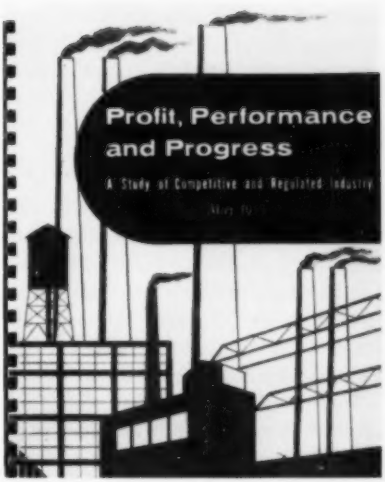
I am going to discuss, without getting into the more technical aspects, two main areas that got major emphasis in the task force's conclusions: (1) regulation and earnings, and (2) profit, performance and progress.

But first, let the committee in its own language tell you of an important by-product of its work:

> "Regardless of what further action may be taken on our suggestions, we think our activity has made one fairly important contribution to improving Bell System earnings. That contribution lies in the fact that some 75 men throughout the Bell System—every company and every department has been represented—have been engrossed in the head-holding, soul-searching problem of seeking ways to assure our future financial health and our future ability to serve the country. These men have been at fairly high levels of the organization. They have made a substantial contribution. The impact of their thinking should be felt broadly throughout the System. This is an unmeasurable benefit but, we think, an important one."

Regulated industry is a large and vital part of our total economy. With reference to all corporations in the United States, regulated industries account for 12% of the total employees and 14% of the total payrolls. They have 23% of the total capital. They earn considerably less proportionally than the unregulated industries. Why is this so?

Should it be so?



One of *the reports summarizing task force studies that has recently been distributed.*

The Development of Commission Regulation

Before trying to answer these questions, a quick glance at the history and nature of regulation will be worthwhile, for it is in that direction that we shall find the answers.

Regulation of economic life by government is as old as government itself. The extent of it has had wide ranges. Today, government controls over business reach in one way or another to practically every business that we know in this country. But regulation of public utilities goes beyond these things; their earnings are regulated by controlling the level of rates.

Special regulation of the utilities is directed chiefly at providing a substitute for competition, at guarding against any possible exploitation of a favored economic position by unreasonably high or discriminatory rates or by failure to serve all those who seek service.

Traces of the public utility concept

can be found in ancient Roman law, in the medieval doctrine of "just price," and in early English common law. From England, the American colonies copied regulation of a sort applicable to ferries, common carriers, bakers, innkeepers, and so forth.

Early regulation was judicial. The courts judged reasonableness of rates from a standpoint of value of service, not profitability. Such judicial regulation was slow, looked backward instead of forward, and was expensive to an individual seeking redress.

Legislative, in contrast to judicial regulation, started in this country principally through the granting of franchises or charters to turnpike and canal companies and, later, to railways, gas, electric and telephone companies. However, the legislative machinery was ponderous. Some legislatures established special commissions to investigate and to advise as to public utility problems. The earliest of these advisory commissions, I believe, was set up in Rhode Island in 1836.

Massachusetts in 1864 and New York in 1855 formed commissions that had somewhat more than advisory powers. In 1873 Illinois legislated to its then two-year-old Railroad and Warehouse Commission the duty of mandatory rate prescription and the power of enforcement. This was the origin of the so-called "strong" commission, a pattern which was well developed by the 1920's and which prevails today.

The regulatory commissions have authority that goes beyond rates and earnings, and includes adequacy of service; accounts, books and records; certificates of convenience and necessity; sales, acquisitions, and mergers. But these things are quite secondary in relation to our present subject.

The Commissions and the Courts

Decisions by a state commission may be set aside or modified by a state court or the United States Supreme Court. Also, a commission is very much guided by the precedents of prior court decisions. So it is important to trace this interrelation over the years in trying to find when and how the public utilities got out of step with the general economy as far as earnings are concerned.

For more than a decade (1877-1890), the United States Supreme Court virtually abdicated court jurisdiction over regulation. In Munn v. Illinois, 1877, it said regarding the legislative power to regulate, "We know this is a power which may be abused; but that is no argument against its existence. For protection against abuses by legislatures, the people must resort to the polls, not to the courts." This shook the business world, and left public utilities as fair bait for unhealthy political pressures.

In 1890 the Supreme Court held that "the power to regulate is not the power to destroy."

Teeth were put into this concept in 1898 (Smyth v. Ames). The Supreme Court held that rates which were too low to yield a fair return on the fair value of the property were confiscatory and would be set aside. This principle was reaffirmed by the Supreme Court in a landmark case in 1923, the Bluefield Waterworks case.

The judicial requirement that rates be based on "fair value" was the law of the land from 1898 until 1944, and during that whole period the earnings of public utilities seemed to follow the ups and downs of the general economy in the same manner as comparable segments of non-regulated industry. But, from 1944 on, the utilities have been

way off the pace as far as earnings go.

Why is this so?

In 1944, the United States Supreme Court in the Hope Natural Gas case removed the fair value of the property as a rate base requirement and set only the end result as the test of reasonableness. While the Court did not jettison "fair value," it paved the way for the commissions, by and large, to do just that. This situation has been aggravated since then by some of the commissions generally finding a fair rate of return in the neighborhood of the minimum needed to enable the utility to attract new capital.

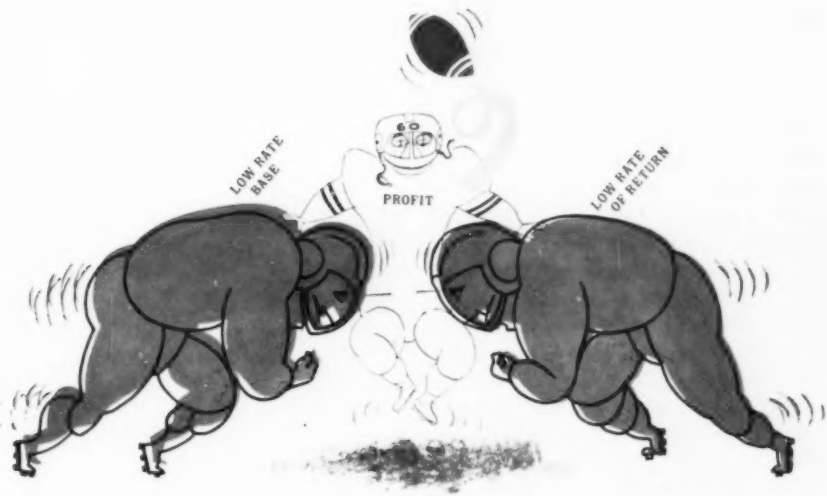
The combination of abandoning "fair value" as a rate base and minimizing the rate of return on the bare attraction of capital theory puts a dramatic double squeeze on the "end result" in a period of sustained inflation such as we have had since World War II.

Rate Base, Rate of Return, and Inflation

The double squeeze just referred to, however, comes about from regulation, not judicial restraint. The Hope decision merely placed more latitude in commission judgment.

As a practical matter, most commissions began to take the easy course of treating the depreciated cost of the plant as a rate base. This is easy because it is obtained simply from the accounting records of the company. By contrast, a "fair value" determination requires some measure of repricing and judgment of the value of the plant in the light of current costs and economic conditions.

In an inflationary era, fair value will invariably exceed the original cost rate base. If fair value exceeds original cost by a third – which is somewhere near



Double squeeze *is put on profit when both rate base and rate of return are too low.*

the current situation in our business – a 6½% return granted by a commission on an original cost base would equate to less than 5% on a full fair value base.

The rate base would not matter much if, in squeezing it, the rate of return were liberalized. But many commissions hesitate in finding rates of return very much above the cost of capital or attraction of capital concepts. Here again the lure of arithmetic enters, for it may be determined historically for the company in question or for somewhat similar companies what capital has cost and the level of earnings that, assuming the future to resemble the past, will attract capital at that cost.

You might characterize regulation by original cost rate base and cost of capital rate of return as regulation by accountancy and statistics, rather than by informed judgment.

Such regulation in these times detaches the public utilities from the free enterprise system as far as earnings are concerned, although the utilities remain in full competition with unregulated business in the purchase of materials and services, in attracting and holding employees, and in securing capital from investors.

Fortunately not all state commissions exert the double squeeze. One state, Ohio, has a law requiring reproduction cost new (RCN) as a rate base. Seven other states have statutes requiring some consideration of fair value. Ten other states have court sanction of fair value. However, the fair value found by commissions in the more recent telephone cases has ranged from 38% down to a token one per cent above original cost.

Some commissions have also been showing an increasing awareness of the inflation problem, and have made allowances in the rate of return and in other ways.

But the public utilities still are off pace with the earnings of non-regulated business. A general indication of this as far as the Bell System is concerned can be had by comparing in almost any way you please our rate of earnings and those of the larger non-regulated corporations. One fairly recent analysis compares for the period 1948-1957 the Bell System return on equity capital with that of the non-regulated corporations currently having the same Moody's bond rating (Aa). Moody's is a widely recognized credit organization. The return on equity capital for these corporations averaged nearly 60% higher over the ten-year period than the Bell System. Only three of the corporations were lower than we were.

Our earnings fall far short of being comparable to what they would be if regulation were truly a substitute for competition.

The Comparable Earnings Concept

In the Bluefield Waterworks case in 1923, the United States Supreme Court stated:

> "A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties . . ."

Again, in the Hope case in 1944:

> "By that standard the return to the equity owner should be commensurate with returns on invest-

ment in other enterprises having corresponding risks."

There has been much perplexity about "corresponding risk." Some people have blindly accepted the view that, since utilities' earnings fluctuate less than, say, manufacturers', the utilities are less risky. That does not follow at all. In competitive industry there are more marginal businesses than among utilities, but the consistently successful competitive businesses may well have less risk than the most successful of the utilities. The former's volume of business may be more responsive to economic winds than the utilities, but risk is not a spot measurement. It includes both the ups and the downs.

The complexities and misunderstandings regarding corresponding risk have greatly impeded the legal concept of comparable earnings from operating as it should.

The task force referred to at the outset of this article concluded:

> "This business should rightfully work for earnings for the long pull in reasonable relationship to those of progressive companies in the competitive field. This is a dynamic concept as contrasted with the static cost-of-capital principle with its survival connotation . . . From a public standpoint, this (comparable) earnings concept, when placed in proper perspective, is eminently reasonable. We do not seek speculative profits. We seek only such profits as will enable us to give the best possible service in a growing economy."

In effect, this urges that regulation function, as intended, as a substitute for competition by letting the life blood of the free enterprise system—profits—flow as freely under regulation as it does under competition.

Profit

Profit has come to have a bad connotation in some quarters, perhaps suggestive of something unearned, something wrongfully exacted from less fortunately situated people. This is a grave misunderstanding.

The task force recited clearly the role of profits in our country and under our economic system. Profits are both the driving force and the end result of business. Monetary gain is only one aspect. Money is the common denominator of the whole process—the capital to establish the business; the buying of materials and services; the paying of employees; the selling of the product; and, let's not forget, the paying of taxes.

But business is more than all this. It is a focusing of human activity. It aims at satisfying human wants and needs. Through the complex motives of people all along the line, business tries to progress and to expand. The miracles of mechanical, electronic and chemical advances in the past century and the vast improvements in the standard of living in the past century and even in the past decade, all testify to this.

"Profit" is not a "bad" word. It is a vital, energizing word. Most competitive businesses rely almost entirely on profits in order to expand, innovate and improve efficiency. From these things come new jobs, new and better products and further improvement in the standard of living.

Profit, Performance and Progress

Some of you have, no doubt, read the report by this title submitted by one of the task force subcommittees.

It has been rather widely distributed to Bell System executives and to interested people outside the business.

This report summarizes studies of specific industries in an attempt to throw light on the effect of profit levels on business performance.

Seven criteria of business performance were selected after careful searching:

1. Growth.
2. More and better capital equipment.
3. More capital investment.
4. More and better products for the money.
5. Research and innovation.
6. More jobs and better pay.
7. Good citizenship and social conscience.

Progress and good performance were found invariably to be linked with good profits, good management and a good product.

The competitive industries studied were textiles, steel, office and business machines, meat packing; Sears Roebuck and the retail industry, and General Electric and the electrical equipment industry. The regulated industries were railroads, airlines, and electric power.

It would be informative if we had space to go into many of the details brought out in the studies. As to the competitive versus regulated industries, the report says:

> "The industry studies show that research, innovation and new products are the life blood of successful competitive companies. But in all regulated industry the only real basic research to be found is at Bell Laboratories. Most regulated firms expect their suppliers in the competitive world to do the research, develop the new equipment and sell it to them. . . .
>
> "For the 10 million owners of American business, most competitive industry has provided inflation protection through good 'real' profits in terms of earnings, dividends and appreciation of investment value. Without these rewards, business could not have met the demands of the past. Without similar future prospects, it will not be able to meet the tests ahead. Regulated industry, on the other hand, has not even protected the investor against inflation. This raises a serious question as to the ability of regulated industry to meet its future challenge.
>
> "Competitive industry has financed more than half its capital growth since the war through retained profits. Regulated industry has done less than half as well.
>
> "These failures on the part of the regulatory system are directly linked with profit performance and profit motivation."

Someone once said, "People get the kind of government they deserve." Something of the sort applies to regulation. If the public is shortsighted or apathetic about the financial health of its public utilities, this will be reflected in the regulation of them.

This is why we place so much emphasis on trying to get public understanding of our rate and revenue problems. The comparable earnings concept and the salutary role of profit in performance and progress are in great need of being better understood. As we have tried to indicate very briefly, an informed public will probably feel it deserves more enlightened regulation, regulation which will more truly substitute for competition in encouraging dynamic performance and progress through comparable earnings.

Increasing the use and the value of the telephone for retail consumers and merchants is the objective of a new marketing program now under way

The Greatest Business Getter of Them All!

Robert E. Johnson, *Administrator Major Account Sales*
MARKETING DEPARTMENT, A. T. & T. CO.

THESE WERE THE CLOSING WORDS of the theme song of a fast-moving musical show presented by the Bell System at the 1959 National Retail Merchants Association Convention in New York.

This "musical with a message" introduced the telephone in the role of a business getter to help department stores increase sales and profits through greater emphasis on telephone shopping.

Several department store trade magazines described the show, called "What's Popping In Shopping," as a "smash hit" which "captivated a capacity audience of about 1400."

TV personality Hugh Downs as master of ceremonies together with Donald Voorhees and his orchestra, ballet girls, and Broadway performers put across to department store executives a "hard-sell" message that telephone shopping can do wonders for store profits.

Why The Show?

Why, you may ask, should the Bell System be interested in department stores and why the "show business" approach in presenting its story?

Well, the telephone business exists because people make telephone calls. Discovering new uses for the telephone makes it more valuable to more people and encourages them to use it. Department stores enter the picture because a study of their communication needs uncovered a vast potential for added telephone usage that would help the stores, their customers and, of course, the telephone companies.

Thanks to the work of people in several Associated Companies, the Chesapeake and Potomac of Maryland in particular, we had a real story to tell —one that would show stores how to gain business and profits.

But to get this story across to department store executives, we had to use the kind of showmanship that is so typical of many department store merchandising efforts.

Shopper-Stoppers

This program of telephone shopping for department stores – "What's Popping In Shopping" being only the kick-off – is directed at overcoming some king-size problems. A glance at these problems makes it obvious why the stores are interested in our program.

Department stores received only six per cent of U.S. spendable income in 1958 compared with about seven in 1948. This failure to keep pace cost the stores $2 billion in sales in 1957.

More importantly to telephone people, these sales fell off because of the following "Shopper-Stoppers":

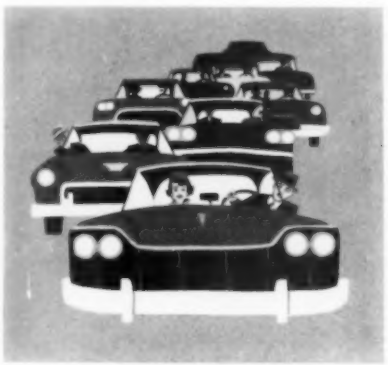
The population shift to the suburbs.

From 1950 to 1958, U.S. population increased ten per cent while suburban population increased 60%. Downtown stores are "too far away" and sales suffer.

Shopper-Stopper: *move to suburbs.*

Downtown parking and congestion.

69 million cars, trucks and buses were licensed in 1958—an increase of 56% in ten years. The shopping housewife sometimes thinks they're all using the road to "her store."



Shopper-Stopper: *traffic.*

Children keep mothers at home.

True, there is nothing new in the fact that mothers have children! But in these days few have hired help

Shopper-Stopper: *child care.*

Shopper-Stopper: *working wives.*

or handy grandparents. Sitters are hard to get during shopping hours—not to mention the expense.

More working wives who have less time to shop.

Some 12 million wives are working—frequently in locations not convenient to department stores.

There are many more Shopper-Stoppers—probably you or your wife could add to the list. But from this small sample telephone people can see how increased telephone shopping can ease these problems for the stores and the buying public. By encouraging the public and the stores to understand and use our product, we increase shopping convenience, department store profits and last—but certainly not least — telephone company profits. At the same time, we improve our customer relations and corporate image with both the stores and the public.

The Shopper-Stoppers were the problems various department store Industry Study teams* went to work on. They were men from the Bell of Pennsylvania in Pittsburgh, the Ohio Bell in Columbus and the Chesapeake and Potomac in Baltimore.

*See "Creating New Horizons For Industrial Communications" *BTM Summer 1957.*

2000 Shoppers Surveyed

An early job was to determine the views of the ultimate customers — the ladies! So a top-flight research organization was engaged to survey almost 2000 women shoppers in Baltimore. Here are some of the interesting bits from the survey:

One woman in three has difficulty shopping in person.

Four out of five had bought by telephone at one time or another.

Certain items are bought by telephone with "high confidence." Among them are bed linens, men's underwear, kitchen needs.

Other items such as china, yard goods, handbags, are "low confidence" telephone purchases.

And, quite understandably, the survey showed women's hats would be bought by phone with the least confidence!

One of the most important items uncovered was that telephone shopping *complements* in-store shopping, doesn't replace it. Women will buy by phone when they might otherwise do without or shop at a more convenient location. Also, new customers obtained by good telephone shopping facilities frequently become new in-store shoppers as well.

But many women indicated they encountered problems in shopping by telephone. Of the frequent telephone shoppers:

60% said store lines were often busy.

32% said they were often disconnected before completing a shopping call.

27% said the salespeople they talked to didn't know the merchandise.

21% complained that store tele-

phone numbers aren't in newspaper ads.

A solid 70% said they'd like to shop by telephone in the evening. Some early birds, 48% of the women, reacted favorably to the idea of early morning shopping — before the regular opening hours.

All this—and a lot more—convinced the study team they had a fruitful market. A test store, Stewart and Company of Baltimore, had been selected for a trial and now the team really went to work.

Stewart's had not been interested in telephone shopping prior to this time and as a consequence:

Space was provided for only eight telephone sales clerks.

Customers complained of frequent busy lines when they called.

Morale of the telephone sales clerks was low.

Telephone sales were only about three per cent of gross sales—less than half the average of many other stores.

Store Objections to Telephone Shopping

As is common in selling, the study team encountered strong objections from the Stewart management. Here are some of the objections they voiced:

"Telephone shopping requires 100 per cent delivery and expensive wrapping."

"Telephone shopping keeps customers out of the store."

"Additional telephone sales clerks would run our costs up too high."

"Telephone shopping facilities take up a lot of costly floor space."

"Returns are much higher on telephone purchases."

"Telephone shopping increases the

Cast *of the Bell System show "What's Popping in Shopping" announce in song that "The telephone is sending store volumes up, up, up!" The show proved to be a "smash hit."*

Working tools *for salesmen carrying the telephone shopping message to department stores include sales manuals, brochures, motion picture, tape recording etc. shown above.*

costs of advertising too much."

After a detailed study, a proposal was made to Stewart's. And when Stewart executives were shown that information from the survey and study answered most of their objections, they agreed to a trial.

The Stewart Story

For the results of this trial, let's return to the musical, "What's Popping In Shopping." The heart of the show was an 18-minute film "The Stewart Story," produced by the Bell System with the actual management of Stewart's as actors. The plot? Very simple! Stewart executives, including the store president, Mr. Greenhill, voice their objections to telephone shopping. Then like the hero in all good movies the telephone company goes to work. In fitting climax, the film closes with the store executives singing the praises of telephone shopping in terms of their own experience! During the film these executives say:

"We have had a *continuous and dramatic rise* in telephone order sales which have increased 60 per cent for the nine-month period ending September 1958 versus 1956. For the same period, total department store sales in Baltimore have decreased ten per cent."

"The cost of selling by telephone, including salaries, wrapping, delivery on 100 per cent of sales and the rental of all telephone equipment is *51 per cent less* than the cost of selling over the counter."

"Our average telephone order sales check is *40 per cent greater* than

Department store *telephone sales girls using the new Automatic Call Distributor.*

over the counter. Returns have been only slightly higher than for the total store."

"Many of our new telephone customers have become in-store shoppers."

"Telephone shopping has immeasurably improved our customer and employee relations."

"The calls automatically come in to a salesgirl ready to take them. *There is no delay* or busy signal for the customer. Within seconds the customer is in touch with telephone sales and discussing the merchandise in question."

Spreading the Story

So Stewart's executives were convinced; so convinced that they were willing to appear in this movie to tell other department stores their telephone shopping success story.

There are 3000 department stores in the U.S. and Canada. How can we best convince the executives of these stores? To help the telephone companies do this, a marketing program for department store telephone shopping has been prepared. Two men have taken this program to the Associated Companies by means of meetings in 25 cities this summer. Literally from coast-to-coast and border-to-border, including Montreal and Toronto, they have conducted one-day meetings with telephone company salesmen and management people discussing ways to interest department stores in telephone shopping.

The photograph of the aids in the marketing program package illustrates the scope of the material included. There was the testimonial movie just mentioned; also, two booklets telling in detail how department stores operate, the value of telephone shopping to stores, and—very specifically—ways for salesmen to convince stores of this value. There was also an outline of a course for store use in training telephone sales clerks and a slide film of pertinent facts from the Baltimore survey, plus the other items pictured.

Before spreading the story we had to be sure that our "line" of telephone equipment would measure up to the increased demand anticipated. Suitable automatic call distribution equipment was already available for large stores requiring more than about 40 telephone sales clerk positions. But for smaller stores a new automatic call distributor was developed. With both of these equipments, telephone shoppers can call the store's telephone shopping number and be routed automatically to a sales clerk. Also, the clerk can easily consult other people in the store if additional information is needed for the customer. The telephone shopping supervisor can tell at a glance if calls are backing up and

check the entire operation without moving from her desk.

With this new equipment we were ready to tell the story – both to the stores and their customers.

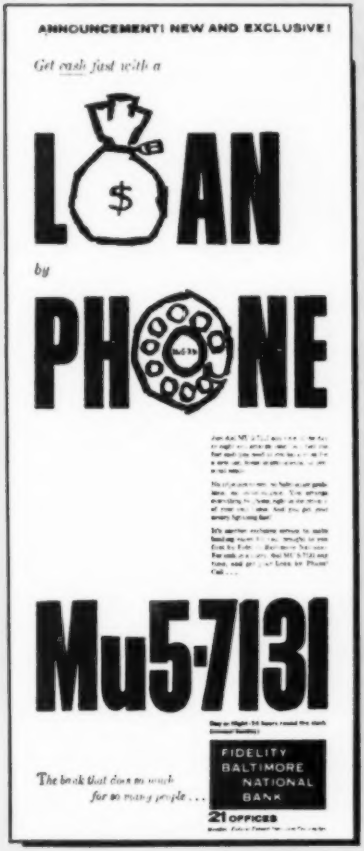
"Shop by Phone When You Can't Leave Home"

This slogan for newspaper and consumer magazine advertising points up our story to stores and shoppers.

But the astute reader may ask, "Why the emphasis on department stores? People shop in all kinds of stores and often encounter Shopper-Stoppers while doing so."

While this is true, department stores were the best place to start since many were already doing well with telephone shopping and could provide *proof* of its value and benefits. Of the numerous other kinds of stores and shops where telephone shopping may have application, groceries seem of next importance because they absorb about 25% of the national retail dollar. And we've found that about 65% of such groceries are purchased at supermarkets.

Do the Shopper-Stoppers apply to these stores? To some degree – yes. However, the supermarkets have com-



Advertisements *of this kind appearing in newspapers and national magazines will help convince stores and also the public of the value and convenience of shopping by telephone.*

Why many women find it difficult to shop in person.

Adult Women — Trading Areas:	Los Angeles	Baltimore
With pre-school children	458,000	105,000
Married and working	406,000	87,000
Single and working	320,000	76,000
With chronic illness	33,000	13,000
Total	1,217,000	281,000

batted some of the Shopper-Stoppers by locating their stores near consumers. In fact some studies have shown that over 70% of supermarket shoppers live within two miles of the store.

In spite of this, many women can't conveniently get to a store even though it's nearby. Samplings made to check this are rather startling as the table above shows.

With this many women finding it difficult to shop in person, why haven't merchandisers — including grocery supermarkets — used telephone shopping to go after this business?

Most merchandisers prefer to push in-store shopping, as compared with telephone shopping, because of the extra sales produced by impulse buying. Besides, supermarketers in particular wish to avoid the expenses of credit and delivery that are usually associated with telephone shopping.

Impulse Buying

Most merchants feel that impulse buying provides a golden path to prosperity. In fact, some estimate that in grocery supermarkets almost half of the decisions to purchase are made right in the store.

Fortunately, the telephone, in the role of a business getter, can also increase impulse buying—by suggestive selling and by enabling an order to be placed *anytime from anywhere!*

In supermarkets, eye-catching packages and hard-sell advertising are often the only salesmen. No longer does an experienced salesclerk suggest butter and jelly when bread is bought —but a skillful telephone salesgirl can!

Suggestive selling is essential to enable the telephone to compete successfully with the impulse buying of colorful packages. Such selling shows good promise in department stores. In fact, some of them report that suggestive selling produces as much as seven per cent of their total telephone sales.

Another type of impulse buying is a "natural" for the telephone. During an after-dinner session with a newspaper or television set, has a particularly good ad ever caused you to think "I'll buy one of these next week end when I have time and the store is open"? Then, how often have you proceeded to forget all about it?

With the telephone, goods can be ordered 24 hours a day, seven days a week—at comparatively low cost to the merchant. As a result, some department stores keep their telephone shopping facilities manned after closing hours. In addition, a few use automatic answering equipment or have after-hour calls handled by telephone answering bureaus. One merchandiser, using an answering bureau for after-hour orders, says, "We're picking up at least 50 orders a night in a number of smaller towns and more than 1000 some nights in Chicago!"

A second merchant estimates that about eight per cent of his telephone shopping business comes in after the store is closed.

Credit

Another reason causing supermarkets in particular to shy away from telephone shopping is the need for extending credit. This reluctance seems out of step with today's buying habits with about a third of all consumer goods being bought on credit. Witness the recent enormous increase in the use of credit cards of all kinds. If merchants are convinced of the *real advantages* of telephone shopping, the provision of associated credit facilities should not be a large barrier.

Delivery

In the ordinary concept, goods bought by phone are delivered—and that is expensive. Available figures indicate delivery costs of 25 to 50 cents per package in many locations.

But trips to the store to save these delivery costs are not always easy. The expense of operating the family car, traffic, parking and waiting in line at the cashier counter are factors to be considered — and may well outweigh delivery costs.

Even so, many women prefer to shop in person and save a delivery charge. To help them, another potential answer has attraction — the *will call* method of shopping. With this kind of shopping, you phone then drive to the store and pick up your package at the "will call" (or "drive in") window. This shopping method probably has promise in suburban areas — particularly with young housewives who need not dress up to go into the store. And the kids can go along without getting

Discussing *the department stores sales program in Dallas, Texas, are Fraser Brown, A. T. & T. and Carl Fuller, C. & P. of Maryland. Carl Fuller, the Bell System's "Mr. Department Store," has worked on the department store sales program since its very beginning.*

This smart *woman shopper saved time and trouble by ordering groceries over the phone. Then she saved delivery expense by using Drive-In window of her nearby suburban store.*

the chance to scamper through the aisles and all over the parking lot!

Are Telephone Shopping Efforts Worthwhile?

We know increased telephone shopping in department stores brings valuable business to the stores and ourselves. At the same time, calls to many other types of stores can be just as important. For example, with department store sales running about $12 billion per year, think of the potential in the grocery business which has annual sales of about $53 billion!

While it is true that telephone shopping for groceries has been largely displaced by supermarket shopping, a renaissance may be in sight. For example, a *telephone* supermarket in California is doing well. The store is in a warehouse. There is no in-person shopping. Clerks wear headsets and greet customers by phone. *All* groceries are delivered—on regularly scheduled routes by delivery vans. Several other similar stores are in operation. From these small beginnings in the grocery field, we hope to produce facts that will prove the benefits of telephone shopping—both to grocerymen and their customers.

Of course, when we think of increasing telephone usage in this general fashion, there are applications other than shopping. All kinds of businesses would like more phone calls from customers. Note the "Loan by Phone" activity as an example. Thus, friends, policemen, firemen, stores — even money—can be as close as your nearest telephone. Clearly, we can help a lot of businessmen and provide more convenience for consumers by promoting increased use of the telephone—*the greatest business getter of them all!*

As the nation moves from "mass democracy" to "mass aristocracy" here are some of the economic forces, the broad changes in markets and industries, that may influence our business environment and our daily lives

The Future of Our Economy

Yale Brozen, *Professor of Economics*
GRADUATE SCHOOL OF BUSINESS,
THE UNIVERSITY OF CHICAGO

IN WHAT SORT OF ECONOMY will the business of the future operate? What problems will it face? What will be the occupations of our future citizens? Will today's automobile companies manufacture tomorrow's mechanical maids and the sons of assembly line workers become engineers designing tomorrow's computer scheduled, self-regulated factories?

One of the ways in which we can estimate the shape of the future is to examine some of the changes which have been and are taking place in our economy. Shifts in the relative importance of different types of industry are among the more important of these changes which can forewarn us of coming developments.

A sharp decrease in the number of jobs in primary or extractive industries (agriculture, forestry, fishing, and mining) is one of the dramatic changes of the past century. In 1870, more than half of our total work force was employed on farms and in mines and forests. By 1930, the figure declined to less than 25%, and in 1950 to 14%. The figure has continued to decline and by 1975 will be less than eight per cent.

Any firm in this group of industries must recognize that as U.S. income increases the amount spent on the goods produced by these industries will not rise in proportion. The income elasticity of demand for these products is not very great. A one per cent rise in national income leads to much less than a one per cent rise in the demand for the products of primary industries. This means that rising productivity in these industries acts to reduce the manpower required rather than acting to increase the total output.

On the other hand, the secondary or fabricating industries (manufacturing and construction) have employed *more*

people every decade. In 1870, only a fifth of our work force was in these industries. By 1900, the number had risen to one-fourth. The figure is now approaching one-third, although the rate of rise has slowed. These industries appear to have reached a plateau in their percentage share of total national employment.

Although the income elasticity of demand for fabricated products was once very high, it has declined as people have moved up the income ladder. At present levels, further increases in income will lead to only enough increase in demand to absorb the product made available by increased productivity. No further increase in the work force will be required.

Up to this time the secondary industries have been growth industries. The market for their goods has been expanding rapidly. If firms in these industries sometimes over-estimated demand and expanded too rapidly, the market usually caught up with them fairly quickly. Now they, too, are moving into a position where they have little margin for error, as the automobile companies learned to their sorrow in recent years.

The Importance of Product Design

Part of the reason for the contrast between primary and secondary industries lies in the great success of the latter in improving product design. A bushel of wheat or a ton of coal today is the same as it was in 1870. Today's automobile or refrigerator, however, is different from last year's and radically changed from a 1929 model. Because of the increasing attractiveness of manufactured products like automobiles and appliances, people not only spent all their increased income on them, in some periods, but also cut back their purchases of bread, meat, and coal in order to buy more.

Business firms must heed this lesson if they wish to retain their markets and see them grow. It is not enough simply to go on producing the same old products by the same old processes. While there are exceptions, improved product design will be essential to future success.

In addition to the extractive and fabricating groups of industry, our economy has a third category consisting of industries which aid specialization. Communication, trade, transportion, and finance fall in this group. A fourth category includes the personal and domestic services rendered by maids, barbers, maintenance people, and hotel employees. Those industries which expand and enrich life—medical care, education, research, entertainment, recreation, and travel—fall in a fifth category.

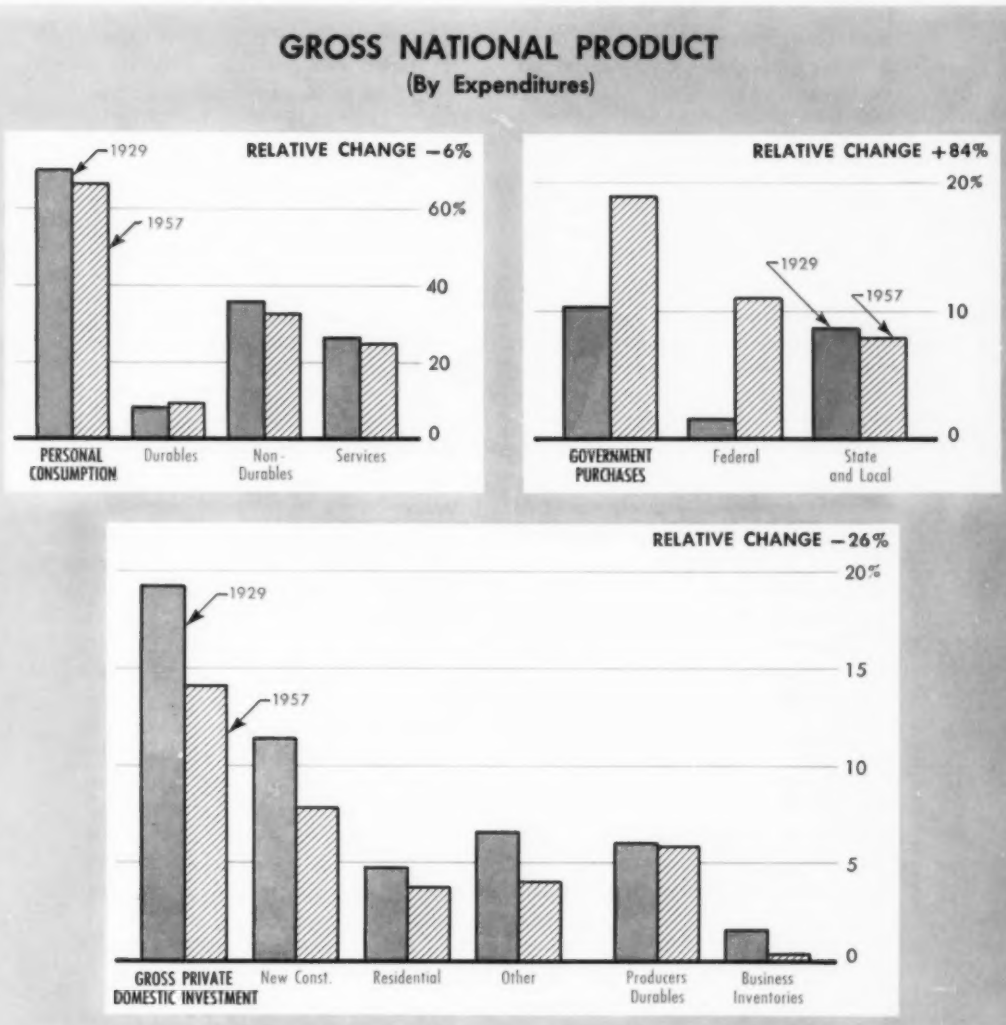
When we examine the growth of an industrial society, we find that in its early stages primary and secondary industries provide the preponderance of jobs and income. At later stages in its growth, the third, fourth, and fifth categories of industry provide larger shares. The relative position of these categories is often used to compare the stage of economic development of one country with that of another. In the United States, which is farther advanced than any other economy, the most rapidly growing industries are those in the life enriching group. The ordinary U. S. citizen is consuming more and more of those things such as education, travel, and recreation, which were once available only to aristocrats in feudal society. The U. S. is moving on from mass democracy to mass aristocracy.

More Leisure and Education

In our economy as we grow richer, we are putting more effort into expanding our leisure time activities and raising educational levels. More of our people now receive an advanced level, general education, and more of our skilled personnel are doing industrial research, practicing medicine, and teaching in colleges.

If the rise in productivity and per capita income continues, it will have three main effects aside from continued growth of the life enriching category of industry. First, we will tend to take more and more of our future increases in income in the form of more leisure time and pleasanter working conditions rather than in the form of more goods. As wages and salaries go up, longer vacations or air-conditioned

Fig. 1. Important factors in our changing expenditure structure (See page 24).



plants and offices may be as attractive to employees as a raise in pay. Second, business will become more highly professionalized. There will be a greater demand for scientists and technicians, because companies will compete with each other more along the lines of improving products and less on the basis of costs and prices of standardized, unchanging goods. Third, opportunities for high pay-off on investment in skill and education will increase, and the educational level of the population will rise. Education is a form of capital, an investment in human beings, that produces income for them. A larger proportion of our capital will be invested in this way.

Our Changing Expenditure Structure

The changes in our industries are a consequence of shifts in spending patterns as well as of differing rates of change in productivity. Although those industries which have done most to increase their productivity have grown faster than those which did least, the changes in the ways in which people choose to use their income as it grows also produces a great impact.

As shown in Figure 1, the changing patterns of spending have caused durable goods to rise in importance while non-durables, relatively speaking, have declined. In spite of the drop in the proportion of income spent for personal consumption between 1929 and 1957, spending by individuals for durable goods rose.

The relative drop in *private* spending for personal consumption does not mean that consumption has decreased. Governments now cut a larger proportion out of individual incomes by taxation. They spend the funds for roads, education, health services, and other items, whether or not individuals who benefit from them prefer these to other goods which might be produced.

With the rise in taxes, individuals have been forced to adjust their spending patterns. They now spend privately a smaller proportion of the national income on personal consumption and on investment. Gross investment by individuals has dropped from 19% of the gross national output in 1929 to 14% in 1957 (and only 11% in 1958). Since a growing portion of newly produced equipment and plant is being used to replace worn out, obsolete, and accidentally damaged capital, the net addition to the stock of capital goods has dropped even more markedly. Our stock of capital is growing less rapidly today than it did in the 1920's. If this situation continues, we are likely to fall behind Russia in the race to build up productivity. Russians are reported to be using 30% of their gross product for capital formation and to be raising productivity four per cent per year. Our productivity is rising at a rate of less than three per cent per year, largely because of our lower rate of capital formation.

Since 1929, there has also been a shift in the division of the national income with a sharp decline in the proportion going to property owners. In 1929, income from rents, interest, and corporate profits amounted to almost 23% of the national income. In 1957, it was less than 13% (see Figure 2).

This decline in income going to property owners is part of the reason for the falling off of private capital formation. Property owners do most of our saving. In this way they acquired property and retained inherited capital. Inasmuch as their share of national income has been cut, they cannot save as much, relatively speaking, as they once did, and, therefore, can-

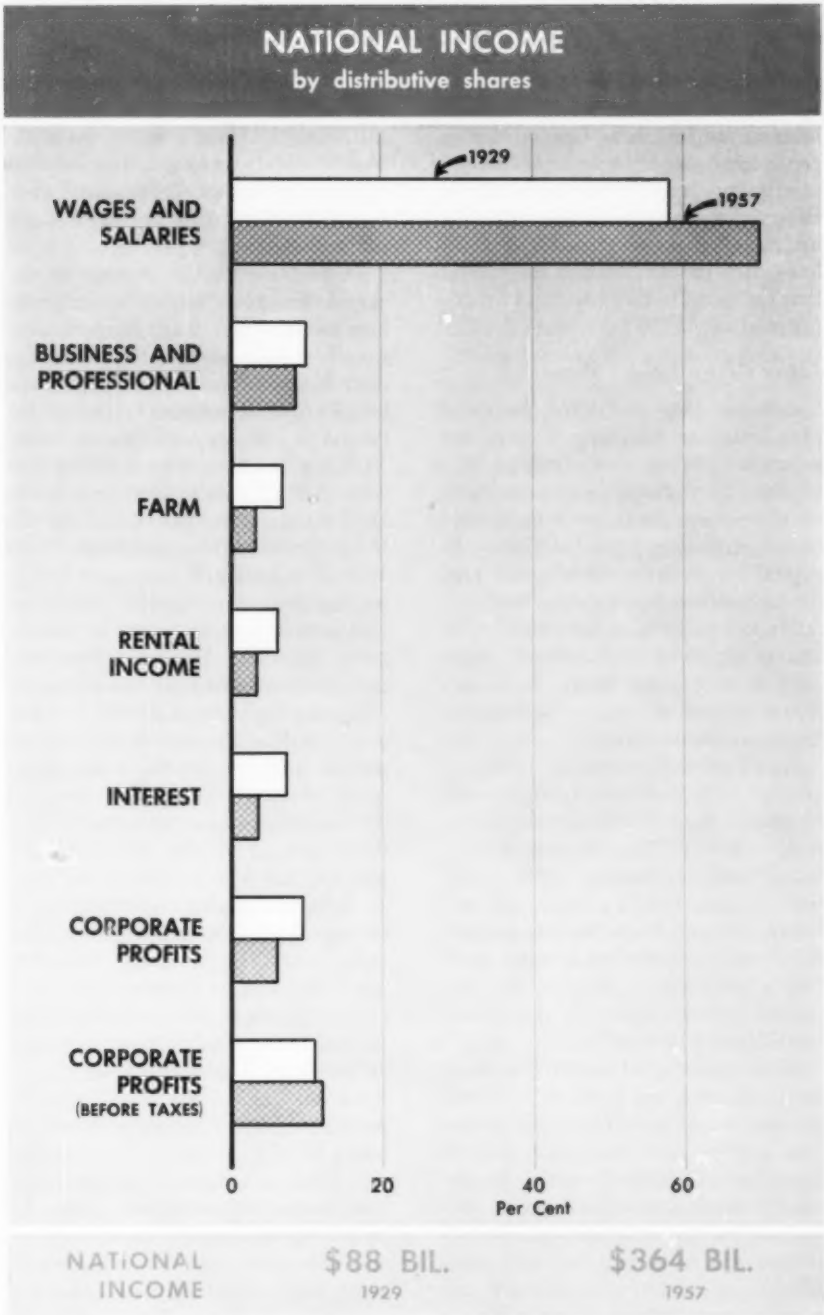


Fig. 2. The shift in the division of national income.

not build up capital as rapidly as before. The return received from investment in property has provided the incentive for people to save in order to acquire property. With a decline in the income earned by property, the incentive has become weaker. Yet, we have such productive uses for capital that we ought to be saving and investing relatively more today than in 1929.

Labor Gets a Larger Share

Between 1929 and 1957, the share of national income going to wage and salary earners rose from roughly 58% to 70%. This growth is a normal pattern for an economy once it has begun developing along capitalistic lines. As capital accumulates, the marginal productivity of workers (and wage rates) tends to rise more rapidly than average productivity. As a result, labor gets an increasing share of the national income as long as capital continues to accumulate.

In all manufacturing in 1929, the amount of capital per employee averaged less than $7,000. By 1954, the figure exceeded $13,000, and today it stands at approximately $16,000. Along with this growth in capital, the real hourly earnings of employees in manufacturing has more than doubled since 1929. Measured in 1958 dollars, the average hourly wage rose from $0.95 in 1929 to $2.13 in 1958.

If the quantity of capital had been increased even more, earnings of employees would be even higher today. The average steel mill, for example, uses about $16,000 of capital (measured at original cost less depreciation) and one employee to turn out 170 tons of products. A modern steel mill using $75,000 of capital per employee can turn out over 300 tons of products per man-year. If capital growth had not been inhibited in past years, average productivity (output per employee) in the steel industry would be much higher. Real earnings, then, would have been higher today (assuming concomitant increases in capital in the other industries).

In addition to the change in the shares of national income which property owners and wage earners now get, there have been other shifts in the distribution of income. In 1935, the top 20% of the nation's families received 51% of the national income. In 1956, their share had been reduced to 43%. The decline is even more striking for the top five per cent of the nation's families, dropping from 27 to 18%. This decline in the upper brackets has been accompanied by an increase in the share going to low-income families. The middle-income groups have remained about the same.

Greater equality of income is tending to reduce the rate of capital formation. In 1929, the top tenth of income recipients saved and invested 37% of their income. The next (ninth) tenth saved 17%, the fifth tenth five per cent and the third tenth nothing. Reducing the share of income going to the top tenth reduces the amount they save, even if the percentage saved remains the same. However, the percentage drops as well as the amount. In 1950, the top tenth saved less than 20% of their income, a drastic decline from the 1929 figure of 37%. The ninth tenth saved only four per cent as compared to 17% in 1929. If it were not for earnings retained by corporations and contractually required savings by those who buy homes, durable goods, and insurance policies on the installment plan, redistribution of income would have had very drastic effects on the rate of progress in America.

Government and Taxes

The size of government's economic activities today is unprecedented for a peace-time period. Government purchased about one-fifth of our gross national product in 1957, almost double the percentage which it purchased in 1929. In addition, government today transfers funds from one group to another by means of taxes and allowances in the form of pensions, subsidies, and relief on a vastly larger scale than it did in 1929. Transfer payments have grown from $1.5 billion to $21.5 billion. In all, more than 25% of the gross national product is disposed of in ways determined by the government. The growth of governmental activity, then, is an important factor to consider in trying to estimate what the future of our economy will be.

There are several reasons why government will continue playing this expanded role in our society. We are engaged in what appears to be a fairly long-term cold war. Hence the need for a large military establishment.

A second factor is the large government debt. Heavier taxes are needed just to pay the interest on the debt.

A third factor is the greater amount of transfer payments made by government. The federal government now pays to widows and orphans and to farmers benefits which did not exist twenty years ago. It pays benefits to veterans of past wars. These transfer payments are here to stay and are something that will have to be reckoned with in the future.

Another reason for the expansion of the governmental role is the growth of paternalism. We are eroding the old American privilege of being a fool. Funds are taxed away from people to make provision for their old age, for the education of their children, for the production of recreational services, electric power, water and transportation services, even though those paying for these items could either buy them directly, or might possibly prefer to do without in order to purchase other things.

Taxes Will Affect Growth

Taxes are an increasingly important factor in the making of business decisions, and will continue to be an important factor because they will remain relatively high. Taxes are having an impact upon the way our productive resources are used, upon the rate of growth of our productivity, and upon the growth of industry.

By and large, the main effect of our tax structure will be to slow the rate of increase of productivity in our economy. One reason for this is that it encourages consumption expenditures in lieu of productive investments and by doing so causes a misallocation of resources.

The type of taxes we use also affects the financial and wage policies of companies. Corporations find that they can minimize their tax burden by raising capital in ways which increase their debt-equity ratio. At the same time, they minimize their stockholders' tax burden by retaining earnings instead of paying dividends, thus permitting stockholders to take their income in the form of capital gains which, of course, are subject to lower tax rates than dividends.

In order to minimize the tax burdens of employees, and increase the attractiveness of a given wage, companies are changing their wage policies. Much more pay is now given in the form of fringe benefits and less in the pay envelope. Although fringe

benefits already exceed 20% of payroll costs, they will continue to rise more rapidly than wage rates. As wage rates go up, the attractiveness of the nontaxed fringe benefits will increase in relationship to taxed pay because of progressively higher rates under personal income tax and for other reasons.

Business Problems of the Future

Economic progress and the changing structure of the economy are going to raise new problems for business management. Many of these problems have been developing for some time, and some companies are already facing them.

As the economic status of the people changes and they become richer, we can expect changes in their wants and tastes. More effort will have to be put into making work pleasant, more attention paid to human relations, and more attempts made to satisfy a wider range of human motivations on the job. What has been known as "enlightened" management in the past will become essential management when companies begin to find that they cannot get workers simply by paying good wages.

Organizational structure will also be affected by the shift in human wants and tastes. Decentralization will increase as it becomes necessary to give a sense of involvement and importance to more and more people. Even when it might not be economically efficient, decentralization of organizational powers may become necessary to increase human satisfactions and attract manpower.

The business of the future will have to be research based. Research is essential to profits as well as to growth. Those industries spending at high rates for research show better returns (despite the expense, or, perhaps because of it) on investment than do those industries that spend comparatively little for research programs.

Scientific progress will require more professionalism on the part of management. Managers will have to be able to appraise the promise of scientific proposals for new or improved products and processes. They will have to be able to decide whether automation can substitute for workers, or whether operations research can substitute for traditional methods of making management decisions.

Whatever the future holds for our economy, survival for any business is still going to be governed by certain basic laws. A business can survive by adapting its environment to itself or by adapting to its environment. If anything, the need for adaptability will be even greater in the future. The progress of science and technology, the changes in our social structure, the shifting nature of industries and markets—in short, all the trends we have reviewed—will require an increasing number of adaptations by business.

To a lesser extent, business will adapt its environment to itself; decentralization, for example, will produce a friendlier climate for business to operate in. More firms will have to concern themselves with public affairs as government makes more and more decisions influencing the fate of individual companies. But for day-to-day operations, survival and success in the future cannot rest on routines simply because they were found efficient at one time; on sacred cows of precedent, or unyielding determination. They will rest on creativity, experimentation, and adaptability.

Telephone Tour

A pictorial report on equipment and service concepts in other lands

HERE, AND ON THE FOLLOWING PAGES, you will see telephone equipment and telephone situations which are at once strange to our eyes—yet familiar. In other words, the equipment, the people, the languages may be different but many of the ideas at work we see here are strongly reminiscent of things we see and do every day. Perhaps one reason for this is that some of them represent techniques which Bell Companies have shared with their overseas counterparts. Apparently these ideas are as effective there as they are here. These pictures also reveal that while we have the most telephones in America we aren't the only ones with handsome, modern equipment by any means.

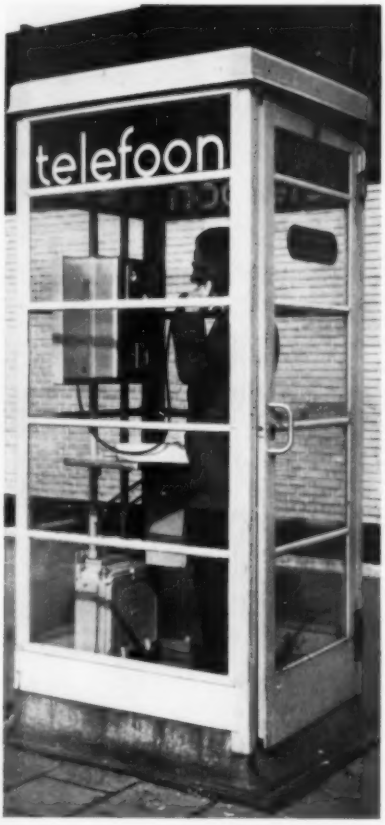
Stockholm: *Obviously, outdoor booths are popular with advertisers as well as telephone customers.*

TELEPHONE TOUR

Germany: *Telephones are conveniently placed along Berlin's avenues*

Photo courtesy of Dr. Blair O. Rogers

Russia: *There, as here, the outdoor booth fills a popular need*



Holland: *There, too, the outdoor booth is a familiar institution*

Netherlands: *The van helps advertise telephone, telegraph and postal service at fairs*

Turkey: *Operators having an off-duty snack in their rest room*

Jamaica: *Training class for operators is seen in session, Kingston*

Formosa: *Business office scene with a group of service reps on the job*

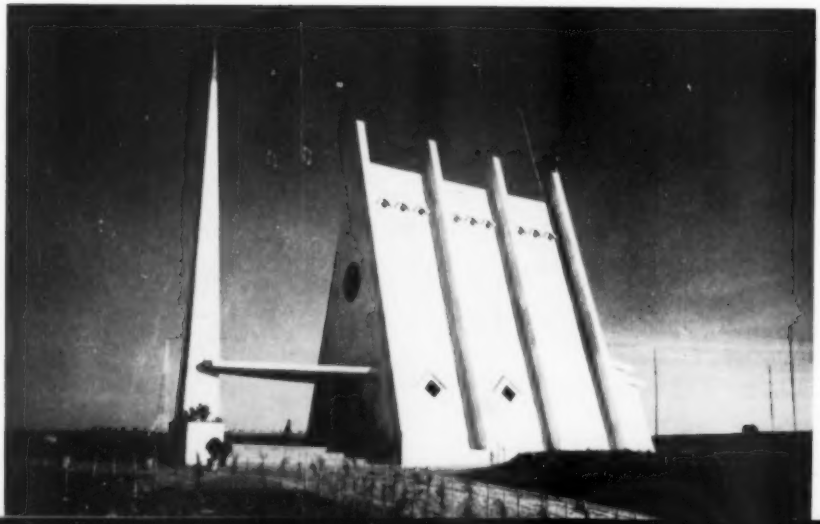
Sweden: *Modern telephone equipment in an up-to-the-minute country*

Spain: *A radio relay tower where Don Quixote's windmills once stood*

Switzerland: *Radio telephone in the high Alps*

Spanish *style coaxial repeater station in Barcelona*

Portugal: *Chapel of St. Gabriel, patron saint of telecommunications, at overseas radio telephone receiving station*



A new service concept of using the regular telephone network to permit machines to 'talk' to machines, the DATA-PHONE *takes us a step closer to the wonders of tomorrow*

DATA-PHONE Offers Improved Communications for Data Processing

John H. Craig, *Private Line and TWX Engineer*
ENGINEERING DEPARTMENT, A. T. & T. CO.

SUPPOSE YOU WERE ASKED to pick out the dominant characteristic of your "world of tomorrow." Would it be space travel, new functional cities, weather control, or automation? If you picked the latter, it is safe to assume you would be one of the majority, for a world full of all kinds of automatic machines to do most of the labor is the dream of most people.

For example, you can picture the day when you can do your shopping by means of a device in your home, perhaps a push-button telephone. You can visualize other devices used to record sales, check credit and inventory down in the store. Perhaps machines will make it almost unnecessary to carry cash with us (except for newspapers, bus fare, etc.) when banks and stores use electronic accounting to transfer credit automatically.

Underlying most of these marvels of the future are data processing and communications. What do these terms mean? Using the example of a department store, *data* simply means any information, such as your name (or code number), the amount of your purchase, the date, the store and your bank. These data are sent into a central point where a computer "processes" the information; the processing consists of locating your account in its memory file, subtracting from it the amount of your purchase, and transferring that amount to the store. Since both the bank and store may have computers this information must be sent among the various computers. This leads to the need for *communications* to allow the computers to "talk" with each other. Communications is needed first, however, to connect the device in the store to the central computer. We see then that the need for data communications is going to grow greater as we have more automation

and more data processing. So, the world of tomorrow can easily be characterized as one dominated by data processing and communications — increasing in volume and speed as the years go by.

Tools of Tomorrow

The wonders of the future don't seem as fantastic now as they did only a few years ago. Much of this is because we have already taken some steps down the path leading to tomorrow. You may have seen, or even used some of the tools of tomorrow in an early development stage. We already have many kinds of electronic computers, and some factories have departments which operate largely independently of human control. As programming of computers becomes less expensive and easier to perform, we will see their use rise rapidly.

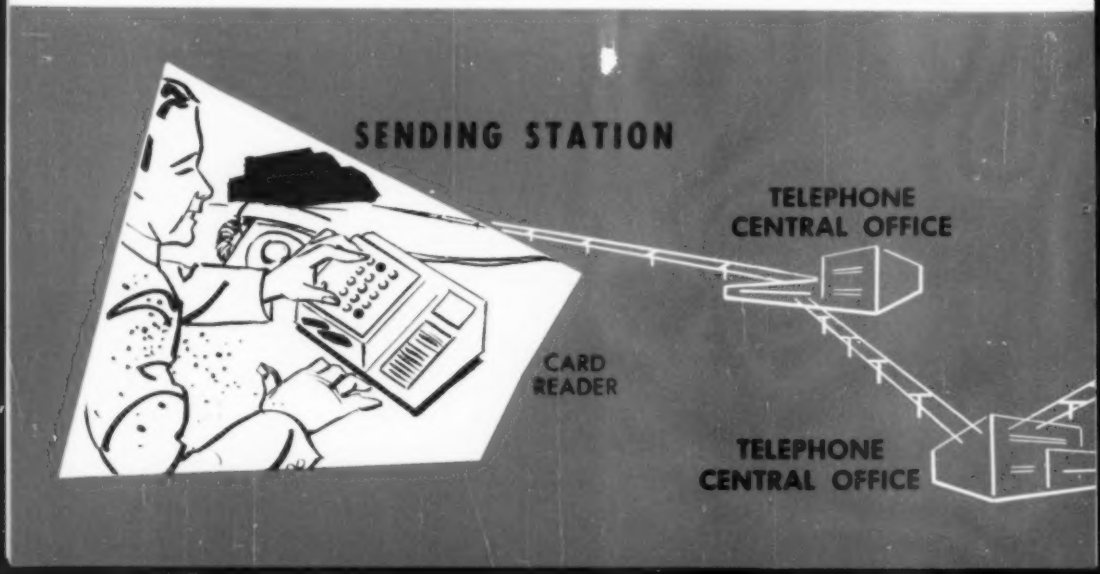
Let us take a look where we are today in data processing and its effect on communications, especially as related to the Bell System.

Today, data processing is already big business. There are many companies producing a large volume of business machines, such as electric typewriters, adding machines, calculators, tape readers and perforators, card readers and punches, tape-to-card and card-to-tape converters, all sizes of computers, various input devices, such as agent sets, and communications machines, like the teletypewriter. Except for the teletypewriter and the agent set, much of the other equipment is used for local data processing where little or no communications facilities are required. Teletypewriters, on the other hand, are largely used to transmit messages over longer distances.

The Growing Need for Communications

Although communications does not play a large role in today's data processing picture it is becoming more and more important each day. Consider a company which has geographically dispersed locations and wishes to use a centrally located computer to handle the inventory control of all its outlying plants. This creates a specific requirement for interconnection of these points to the computer — if the com-

DATA-PHONE *in operation is illustrated by sketch below. In this application, low-speed parallel transmission is used for accurate data communication between locations at low cost.*



puter's capability is to be effectively used for up-to-the-minute control. (Otherwise the mails could be used.)

Here is where the telephone companies can and should provide the necessary facilities to make these connections. A possible answer might be to use a separate data network. But this is a tremendous job and costly, too. A more practicable answer is to use the regular telephone network. The name DATA-PHONE was coined to give a name to the new service concept of using the regular telephone network for transmitting data. Data here means any coded signal and is usually expressed in *bits*—a discrete "yes" or "no" (*b*inary) dig*it*. The transmission speed is expressed in bits per second.

Flexibility is Keynote

The flexibility of the existing telephone network is one of its greatest advantages. This flexibility is found in its ability:

To handle messages of any length from a few seconds to many hours.

To handle voice and data messages in many codes and at many transmission speeds.

To provide coverage throughout the country to over 60 million telephones.

Even though it exists and is universal, if it were not flexible the telephone network would be of little use in handling data. It is this inherent flexibility which makes its use attractive in all kinds of future service offerings.

Machine Talk

In using the regular telephone network for data traffic we must change the data signals — normally d-c. pulses —into signals appropriate for the regular telephone network. This function is performed by a DATA-PHONE "subscriber set" or "subset" — specifically it translates each d-c. pulse into a tone (or tones) for transmission over the telephone network. This subset performs the same kind of function for data that the familiar telephone subset does for you and me. That is, it takes the "machine talk" and changes it into signals to send over the telephone network. By itself the DATA-PHONE subset serves no purpose. But when properly matched with a machine it allows the machine to "talk" to another machine, just as the tele-

phone subset lets people converse.

DATA-PHONE, using a recorded carrier subset and a digital subset, has been available for a little less than two years. These subsets were designed to transmit data at high speed – 600 bits per second. This speed is one which our telephone plant accepts without difficulty, and one for which design techniques were available. A relatively small quantity of each of these subsets was made up in the Western Electric model shop to get some idea of customer needs.

Customers' Needs Are Diverse

Service with these subsets has been quite successful on the whole—showing that DATA-PHONE is technically feasible and practical. Our experience shows that it has a wide field of use. For example, it turns out that our customer needs are diverse and are substantially larger in the low and medium speed ranges than originally contemplated. In fact, the first extensive use of DATA-PHONE is in the low speed range. We have had discussions with many business machine manufacturers as to how their equipment will fit into DATA-PHONE service. We found them all enthusiastic to get into this business—some are very active now.

Also, customers through us and the business machine manufacturers have clarified a substantial need for one-way as well as the original two-way systems. The one-way system is practicable where there is no need to send data back to the originating station. Examples of this are production control, attendance reporting, stock ordering, etc., where only a simple acknowledgment signal is needed.

What's on the Shelf?

The subset is the key item in DATA-PHONE as far as the Bell System is concerned. This being the case, let's look at what subsets we have on the shelf and what new ones we plan to put there. First on the shelf there are the high speed (600 bits per second) digital subset, the recorded carrier subset (includes built-in speed changing facilities) and the low speed (75 bits per second) 130-type subset.

These subsets have been real life savers in getting us under way, but none of them is expected to be used for very long in their present design. We are already redesigning the high speed digital subset to simplify it and extend its speed range. Also under development is a higher speed (up to 2000 bits per second) digital subset. We have decided to discontinue further effort on the recorded carrier subset, inasmuch as the business machine people are providing, in some cases, equipment that does not need the speed-changer and, in other cases are including the speed changing facilities. However, we are redesigning the low speed 130-type subset to reduce its cost so that we may use it for a variety of new applications.

Something New—the Parallel Subset

All of the subsets now on the shelf are serial subsets. That is, they send pulses out on the line one after the other at the indicated speed, 75-2000 bits per second. Not quite on the shelf but available on a model shop basis are some "parallel" subsets. These subsets will accept the data signals produced by card readers, for example, on a number of leads representing a character (letter or numeral), and send out combinations of several tones corresponding to the character. It is much like operator key pulsing familiar to many of you.

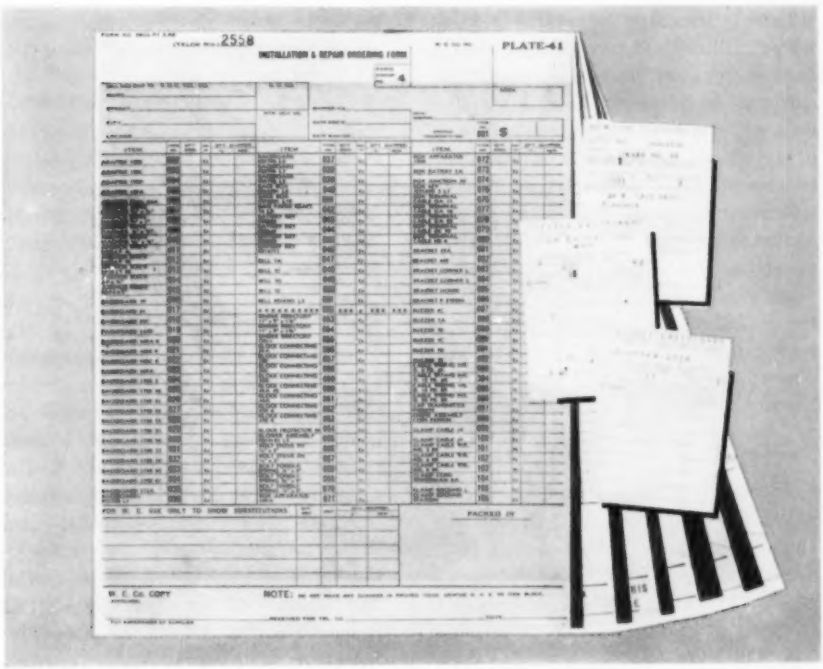
Both high speed and low speed parallel subsets are being developed, principally for data gathering applications. The transmitting subsets are simpler than the receiving subsets—in fact, the low speed transmitting subset is about the size of a king-sized pack of cigarettes, uses transistors, and requires no power except for that supplied over the telephone line. The receiving subset serves a large number of transmitting subsets on a one-at-a-time basis so that its higher cost and complexity are completely acceptable.

How Are They Used?

An example of low speed parallel data transmission is found within the Bell System.

The installers in the Operating Companies today are required to prepare written orders for the equipment they need. These orders are received at the Western Electric Distributing House where clerks process the order. This manual handling is time consuming, subject to error, and expensive. It was a natural candidate for mechanization. To solve this problem the Western Electric people designed a new system using a new simple card reader which works with the new parallel DATA-PHONE subset to transmit the required ordering information over telephone lines to a central card punch. The punched cards are fed into a card reader associated with a computer.

Each installer (or other authorized



Cards *(right) replace items such as those on ordering form. When cards are put in card reader, data are transmitted accurately via* DATA-PHONE *eliminating much paper work.*

Experimental *model of card reader is seen above.*

person) has his own number to uniquely identify him. The computer is programmed to recognize his number, not only as a name, but also his ordering authorities in terms of total dollars, and specific quantities of individual items, and his delivery address. Each item to be ordered has its own number as well. These numbers are punched into business machine cards, one-third normal size.

In use the installer places a telephone call to the central point, inserts his identity card, and follows with the cards of each item to be ordered. He uses a keyset on the card reader to key in the quantity of each item. The system uses error checking and different tones to indicate an "OK" transmission, or one in error. In case of an error the operation is repeated.

Although Western Electric supplied the initiative in the design of the card reader it is basically a "business machine" and as such will be made for System use by outside manufacturers.

Teleticketing

Another low speed application is proving of great value to the airlines. Here conventional teletypewriters are used with a low speed serial subset—at present a 130C1—to transmit tickets from an airline office to a customer's location. DATA-PHONE opens the door for any customer to receive tickets from any airline. Called "teleticketing" the system works this way. First the customer, or his agent, calls up an airlines office to request space. The airlines agent checks the space inventory —in some cases through an automatic system—and finds the space is available or suggests alternatives. Heretofore it has been necessary to send a messenger to the airlines office to pick up the ticket. Now with teleticketing the airlines office originates a DATA-PHONE call and when the called teletypewriter is on the line the airlines operator types out the ticket.

The airlines are anxious to provide this service to their customers as soon as possible. Trials have already established it in their eyes as a valuable service. Before the year is out we will have teleticketing installed and operating at many locations.

DATA-PHONE *for Present Users?*

As we look around at today's service offerings it seems that there are some that present users might find more attractive on a DATA-PHONE basis. For example, TWX customers might find it more to their advantage since they would achieve mechanization and share the great flexibility of the telephone network. A low speed serial DATA-PHONE subset would make this possible. A low cost, light duty keyboard machine – now under development at the Teletype Corporation – should attract many new users.

Others, those with automatic private line switching systems for example, might find DATA-PHONE more attractive. For example, it seems certain many would welcome the removal of the switching equipment from their premises. The added flexibility of service, especially the ease of changing the quantity and location of stations would probably have a strong appeal for others. New, low speed serial DATA-PHONE subsets arranged to provide for automatic message origination and unattended answer would solve this need. Teletypewriter station apparatus could be arranged to work with these subsets to provide for automatic establishment of the connections and transmission of messages. This combination of teletypewriter station apparatus and DATA-PHONE subsets would permit machine-to-machine talk with no human action except preparation and reading.

How About Tomorrow?

What new things are under study? In what direction are we going?

It is clear that we can expect a large volume of data traffic in the coming years. What will our role be in handling this traffic? Our fundamental aim here is to provide the communications channels and the switching equipment—including the DATA-PHONE subsets—connecting our customers and their machines with each other rapidly and cheaply. We expect our customers to provide the data processing equipment at either end.

We are cooperating with the business machine manufacturers helping them to understand the implications and opportunities for them and their customers, too, in the DATA-PHONE approach. Many of these manufacturers are experimenting with equipment which will connect into our subsets. Some have equipment available now, others are in various stages of development with many new devices in the idea stage. So—for the future we see a greatly expanded use of all kinds of business machine equipment, especially the low speed input devices and centralized computers. We expect that we will have a "family" of DATA-PHONE subsets to permit all kinds of business machines operating at any speed to use our switching system.

Most of our thinking today involves the use of existing central office equipment to accomplish the circuit switching. For the high speed operations of the future its speed of connection will be too slow. Fortunately the future will give us electronic switching systems which inherently operate at a speed many times faster than today's equipment. Perhaps we will also find the electronic PBX a useful tool to speed up data communications.

In a nutshell—we expect to have the transmission facilities of any required band width—electronic switching systems—and the DATA-PHONE subsets to allow the Bell System to furnish the kind of data communications our customers will want.

Receiving *equipment records data automatically once telephones are connected.*

The shifting patterns of population and the changing distribution of purchasing power in the years ahead can have far-reaching implications for our industry

Planning for the Sixties

J. Robert Talbott, *Commercial Division,*
OPERATIONS DEPARTMENT, A. T. & T. CO.

THIS IS THE AGE of the metropolitan area. All across the nation the population is shifting; the trend is for people to live in communities of unprecedented size. It is also the time of dramatic shifts in purchasing power. It is likely that by 1970 there will be more families with incomes over $7,500 than with incomes under $4,000. This will effectively turn upside down the ancient pattern of most people at the bottom of the income scale, few at the top.

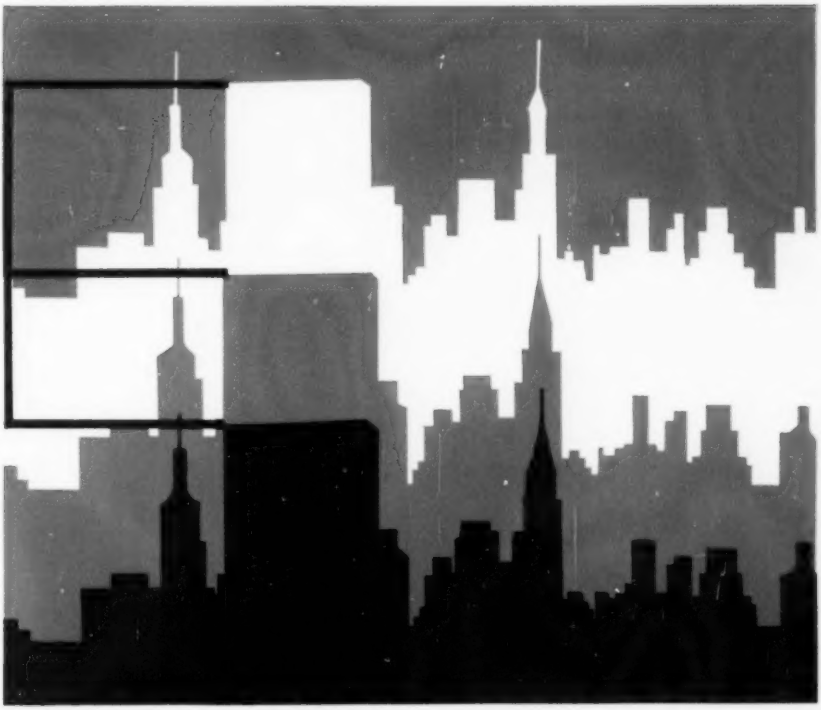
We are often inclined to think that these changes began only recently—say within the past ten years. But both of them have been developing for at least 50 years. They have been gathering momentum for the spurt we have witnessed in the '50's and expect to see again in the decade ahead.

Both the trend in geographic distribution and in income distribution will have far-reaching consequences for the telephone industry—its customers, employees, owners and suppliers. Constant study will be necessary to keep pace with the shifting patterns of population growth. Service offerings must be accommodated to these new patterns—particularly with regard to the distance over which a customer can call for a fixed charge. And the changes in purchasing power of so many people will mark the end of growth of some of our products—but opportunities for the growth of many more. All of this is likely to lead to a continuation of large construction programs.

People—The City Society

Let's begin our look at the sixties with people. Every three years we will add more people than there are now in New York City. Total population of the United States will rise from 175,000,000 today to 215,000,000 in 1970.

The big question, of course, is: Where will they live? Over 60% of our population now lives in or around cities of 50,000 or more—metropolitan areas by government definition. This will probably rise to between 70 and 75% by 1970. Thus the growth of these cities will account for at least three quarters of the growth of the total United States. Within these cities themselves



Every three years *the U. S. will gain more people than there are now in New York City.*

there is an enormous range in distribution, with average population per square mile less than 1,000 in the suburbs but as high as 5,000 to 15,000 in the central city depending on the city's size. (That is, cities under 100,000 average 5,000 and cities over 100,000 average 15,000.)

Other locations will have increases in population, including a number of smaller cities which will reach metropolitan status. But most of the country's rural areas, most of the small towns, and a few of the large ones will be sending much of their increase to the large cities, with some exceptions of course. Nearly 200 of these cities now classified as metropolitan areas are magnets for U. S. growth.

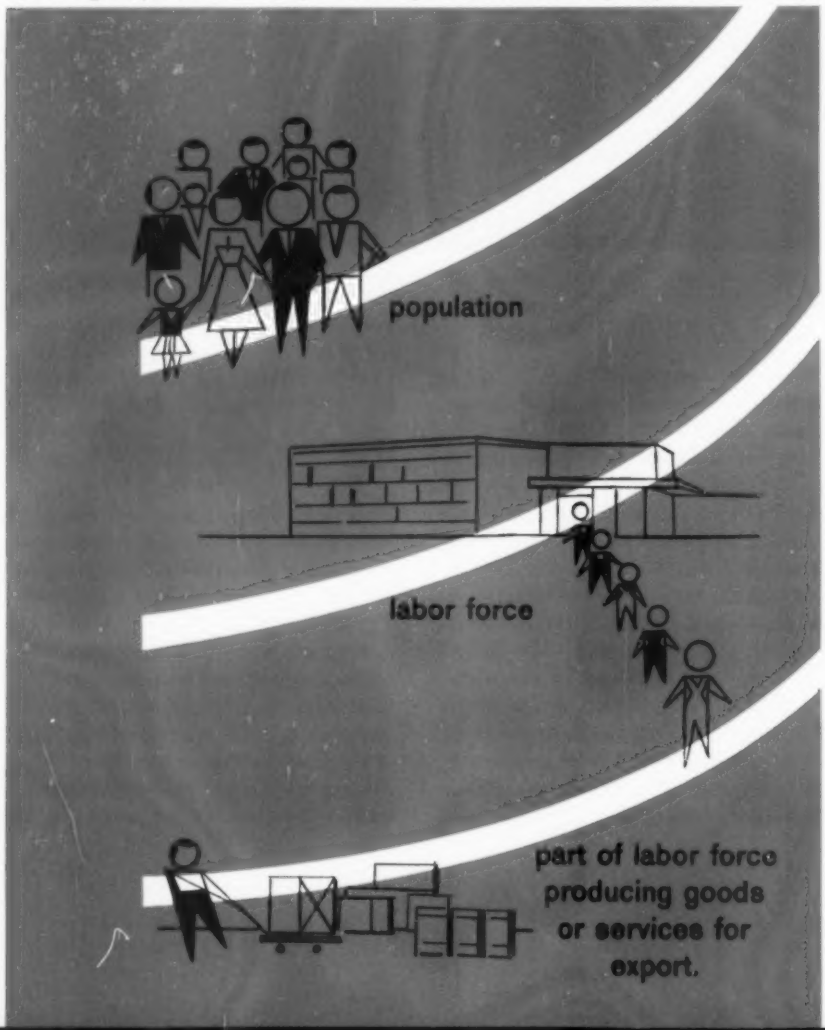
Economics, Regional Location —and Habit?

Not all large cities will grow, of course, and those that do will grow at varying rates and in different patterns. Which will grow—and how fast? Professor Bogue of the Scripps Foundation has found that spurts in growth rates seem to carry considerable inertia and last for several decades, so a partial answer to this question is simple enough—those large cities which have been growing will probably continue to do so.

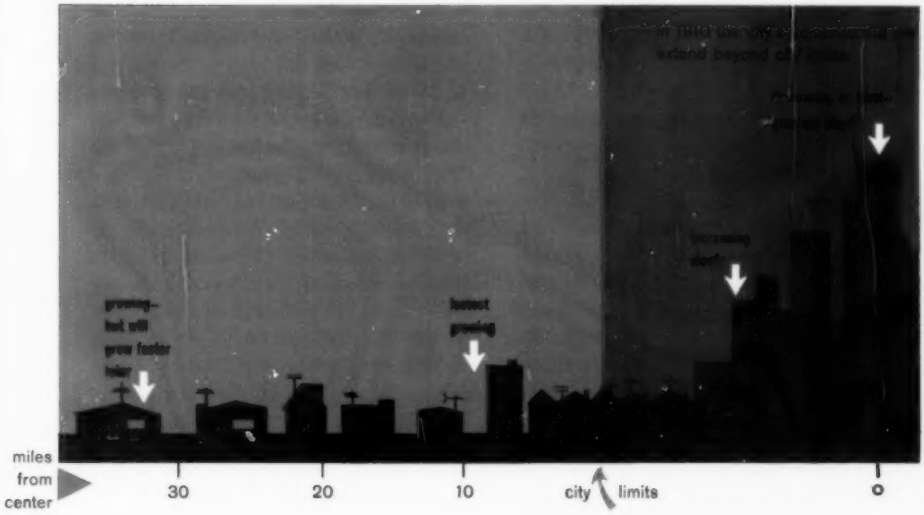
But from here on our analysis of the factors influencing city growth becomes more difficult and only limited conclusions can be drawn. By size, the very largest (over 1,000,000) tend to slow down a little in rate of growth. By regions, those of the West and the South have grown more—for different reasons, however; the southern cities have gathered their growth from their own rural surroundings, whereas the West draws its city growth from the nationwide westward trend. There is also some connection here with the way in which a city grows. The cities which have grown less rapidly have had relatively more movement to the suburbs —and vice versa. There is a regional connection here, too, in that many of those with relatively greater movement to the suburbs are in the Northeast and North Central states.

Thorough analyses of more basic reasons for these trends are not avail-

Formula for growth: *Ability to specialize, and thus sell products over wide areas, helps cities to grow faster than rest of the country and some cities to grow faster than others.*



Influence *of the average large city on population growth now extends 35 miles.*



able. However, it seems that economic opportunity, i.e., more jobs, would be a requirement for the continued growth of any city or locality.

Of course, all types of employment are not the same. Localities with businesses that can sell their products (goods or services) in other localities have an extra source of income and an added stimulus to growth. It is this ability to specialize that causes our cities to grow faster than the rest of the country and causes some of them to grow faster than others. To be sure, there are other influences—but this is often a major one.

Concentration Leads to Deconcentration

All of this growth obviously has not left the city itself the same. As houses and buildings are constructed the land they occupy is tied up for many years. Consequently growth can come only by filling in the gaps or pushing out beyond the edges. By this process the peak growth rate occurs progressively farther and farther from the center. (Substantial growth can occur in areas already built up, through adding apartments, but this generally is not large compared to the population already there.) The fastest growing area for the average large city is now at least ten miles from the center and the range of influence of the city on growth is over 30 miles. Back in 1900 heaviest growth and the range of influence were both less than five miles out.* This spreading out is not a peculiar product of the post-war period, although we have witnessed one of its greatest effects since then. Even during the '30's, when total population increase was slower, this redistribution occurred.

*Data from *The Changing Shape of Metropolitan America* by Amos Hawley. The Free Press, Glencoe, Ill.

Its first sizeable push beyond the city limits occurred during the 1920's when it began to vault into completely new areas instead of always growing just beyond existing development. The greatest single cause of this tendency to deconcentrate was probably the growing number of automobiles.

This spreading out of the influence of the city on growth to distances of 30 miles and more means that some of our cities are bumping into each other. Actually, where this happens their combined influence makes the area in between them grow faster than their other suburbs. In some parts of the country this is creating continuous urban strips stretching for great distances. These, however, are still a product of the cities which created them.

In summary, then, we have a pattern of rapidly increasing population distributing itself quite unevenly. The natural increase in population across the entire country has been flowing in a stream of growth to the cities, building up their concentration of population in successively wider rings.

This concentration of growth has not been an unmixed blessing for the telephone industry, for at times it has been difficult for us to keep pace. But imagine the problem had it been scattered all over the land! Understanding and preparing for the future course of this growth is one of the biggest problems facing our industry today.

Decline in the Center

There are other parts of the story of population growth and relocation that are important to the telephone industry.

We have said earlier that the distribution of population within our cities is quite uneven, with a much greater density at the center. Actually this may be changing a little, for at the very center of some of our cities population is declining. This decline spreads in successively larger rings just as the original growth did, and in the case of some of our largest and oldest cities the population of the entire area within the city limits has declined. This occurs after commercial establishments take over or the residential units become old and less desirable. (The construction of apartments and the subdividing of older residences may have preceded this phase.) A renewal of residential growth in these downtown areas is complicated by the high costs involved for acquiring the land, demolishing the existing structures, and erecting new multi-unit buildings. At present this activity is on a scale insufficient to offset the general decline in population. The choices open to communities are for these areas to be filled by commercial buildings, or new apartments, or for them to become slums. And this will be a recurring problem as the structures in other residential areas age. The advantages to the community and to the telephone industry in keeping these areas productive are obvious.

The Fastest Growing 'Occupation'

Earlier we noted the influence of economic opportunity on community growth. As an exception to this we must recognize the growing number of people whose income is unrelated to any particular spot on the map. Among these are the retired and pensioned, widows, and those with independent income. Social Security benefits alone will amount to 18 billion dollars annually and go to 19 million people by 1970 — more than the present number of employees in all manufacturing establishments in the United States and over six times the current wage and salary payments of the Bell Sys-

tem. Research by *Fortune* indicates that "There are now about 5,500,000 persons over 14 who are not working or looking for work, not going to school and not keeping house. And they represent the fastest growing major 'occupation' in the United States today."*

Some of these people will be able to live where climatic or other conditions suit them. They will be traveling extensively. They may be maintaining two residences. And they will need to keep in touch with their families and friends from all of these locations. Implication to the telephone industry: The need to anticipate where they will live plus a significantly increasing market for long distance service.

Every Day is Moving Day

One other factor of the utmost significance to our business is the whirlwind pace at which people move around. Although it is difficult to imagine, more than one of every five of our existing subscribers will either relocate or give up their service this year. This will amount to almost seven million, over one million of whom will move to residences that did not previously exist. And the moving habit seems to be growing. With a larger population, what is now seven million will become ten million a year by 1970. Providing telephone equipment for new homes and new neighborhoods will be a continuing and growing job. This we must do even if all this movement does not mean additional revenue to us – which it will not unless the older localities are reoccupied by other customers.

It is probable that as much as five percent of our net increase in customers each year is offset by a decline in customers in locations where equipment is available. As mentioned earlier, this comes from declining population and declining income in the older sections of cities. It is possible, but by no means certain, that some of these areas will be revitalized so that some new growth will occur.

Income—$3,500 More

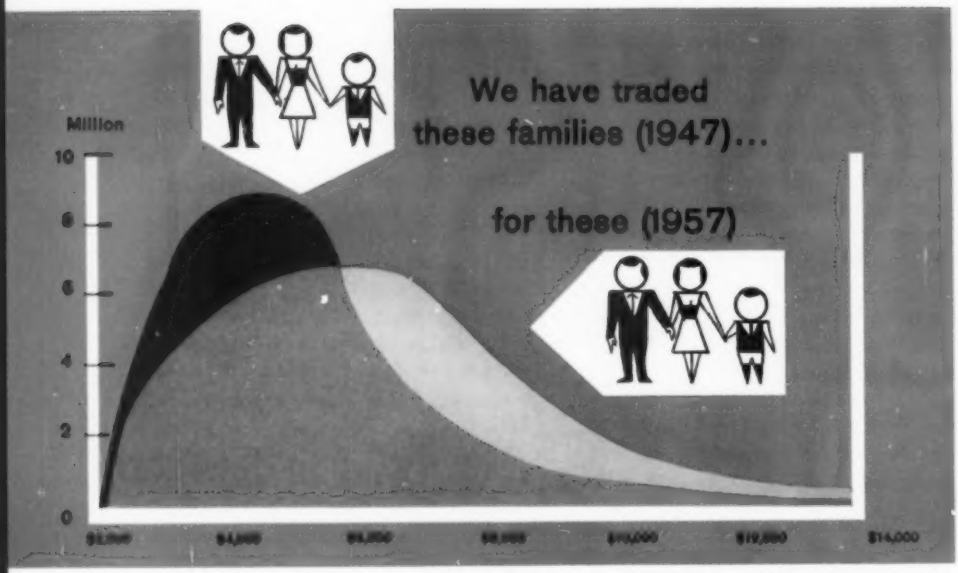
The story of so large an increase in population might be painful rather than optimistic if we could not also relate the story of money. What's the difference between an income of $4,000 and one of $7,500? What will the difference buy? What would you buy with $3,500 more each year? Another car? A bigger home? This fascinating prospect faces many American households. Although no one family may necessarily expect this kind of an increase, the proportions of families below $4,000 and above $7,500 will shift sharply for the better. Even when expressed in averages it looks good. For annual family income, which has risen from $4,600 in 1947 to $5,600 in 1958, is expected to be $6,800 in 1970 (after taxes and in dollars at their 1957 value for all three years).

Note the lopsided shift in the curve shown. In a very general way it is the group that has shifted from *under* $4,000 a year to *over* $4,000 a year that now has income over and above that required for the basic necessities of life – food, clothing and housing. They can use this purchasing power to expand markets for things over and above basic requirements or for things which satisfy those basic requirements more expensively.

Even several years ago F. L. Allen said in his book, *The Big Change*, Harper & Brothers, N. Y.:

"Consider for a moment a contrast with regard to nylon stockings. At

*"Decade of the Discretionary Dollar," *Fortune*, June 1959



Credit: U.S. Department of Commerce, Office of Business Economics.

Upward shifts *in income provide more discretionary purchasing power; more than is needed for food, housing, etc. Figures here are before taxes, no adjustment for price rise.*

the turn of the century silk stockings were a mark of luxury. In the year 1900, in a nation of 75 million people, only 155,000 pairs were manufactured. In the year 1949 the American sales of nylon stockings—considered by most people at least as fine as silk, if not finer — were not 155,000 but 503 million pairs: enough to provide every female in the country, from the age of 14 up, with between nine and ten pairs apiece. How is that for an example of .... luxury for all?"

As indicated earlier, during the sixties a still greater proportion of income will be available for discretionary purchases. The largest group of our families will have incomes in the brackets which we now consider as being at the top of the scale. Thirty-three per cent will be over $7,500 (compared with 20% in 1957). Only 26% will have under $4,000 (down from 40% in 1957). And over half of those in the $7,500 and up category will actually be over $10,000 (after taxes, 1957 dollars). This will indeed call for a change in approach for any firm wishing to grow — most certainly for the telephone industry.

Any complete look at the future must recognize that in spite of this great increase in wealth over 11 million families will have less than $3,000 annual income in 1970. These will be largely, as they are now, the retired, the aged, the unskilled, and families headed by women.

The causes of the increase in income and the changes in its distribution are outside the scope of this article. *[See*

"The Future of our Economy" *in this same issue. Ed.]*

Purchasing Power and Telephone Growth

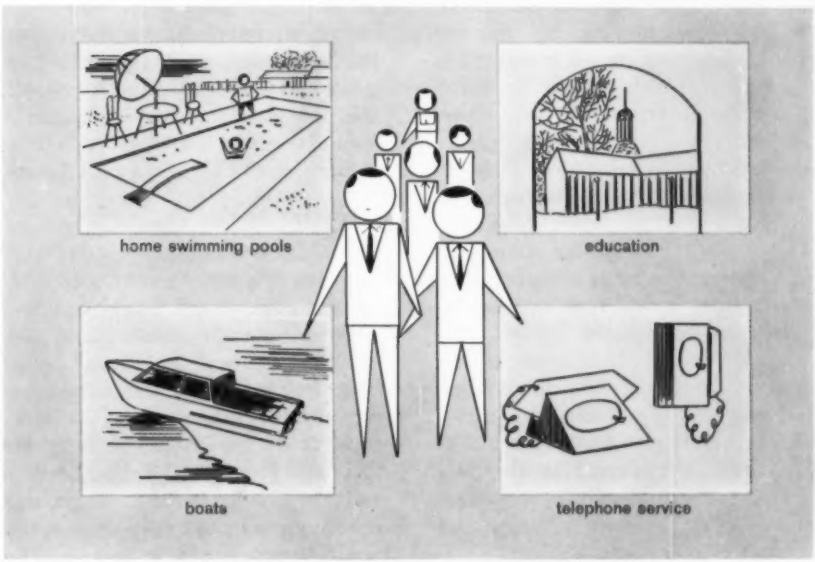
The prospective use of this additional income is significant not only to the people who will have it; it is significant to every business enterprise. Each business must react and adjust to this change or gradually see any hope of increasing its revenues dwindle away. The telephone industry is no exception – in fact it will probably be affected more than many others.

We asked earlier what you would do with $3,500 more a year. Would you buy a new house? Consider the other side of the coin in trying to answer this question – the position of the home building industry and its raw material suppliers for example. For a good many years American families have not appreciably increased the proportion of their income that is spent on housing. Obviously there is a possibility of changing this. Many people do not have all of the things which the industry can offer – more room, more modern equipment, newer neighborhoods, different style, etc. Millions of them will increasingly have the free choice of acquiring these things on an ever broader scale. But they will also be free to choose something else – bigger vacations or more education for the children, for instance.

If the home building industry is to keep or increase its share considerable effort, in terms of detailed understanding of the changing needs, wants, and financial capabilities of the people may be required. Obviously, this will also be true for our industry.

Nor is the mere size of the total market the whole story. Purchasing power

More people ***can afford more of these . . . which will they buy?***



is increasing to the point where the amount of discretionary income is producing large markets for items once considered as strictly a luxury and saleable only on a very small scale. Home swimming pools, boats, and hi-fi sets are illustrations of things of this nature.

This also introduces the possibility that customers may be in and out of these markets from year to year since they are not necessities.

Telephone Markets—Some Old, Some New

Look now specifically at the effect of all this on our own business. The telephone industry has been able to grow as a result of changes in income distribution, population increase, and lower price tags (our prices have risen less than the over-all cost of living). The original basic product – communication to and from a residence using one telephone instrument – has grown much faster than the increase in the number of residences, as shown on the chart, so that now almost 80% of the households in the U. S. have this service. This still leaves a very large market to provide further growth – over ten million. However, it does foreshadow the depletion of the market which has provided growth throughout the entire history of the industry. In considering this market depleted, however, note that this ten million unsold market plus the increase in households from population increase – twelve million between '58 and '70 – will probably produce a net annual demand from residences in the Bell System of about one and one-quarter million. This is almost 20% higher than any comparable period in the past and since this represents net increase, it does not include the effects of the relocation of population.

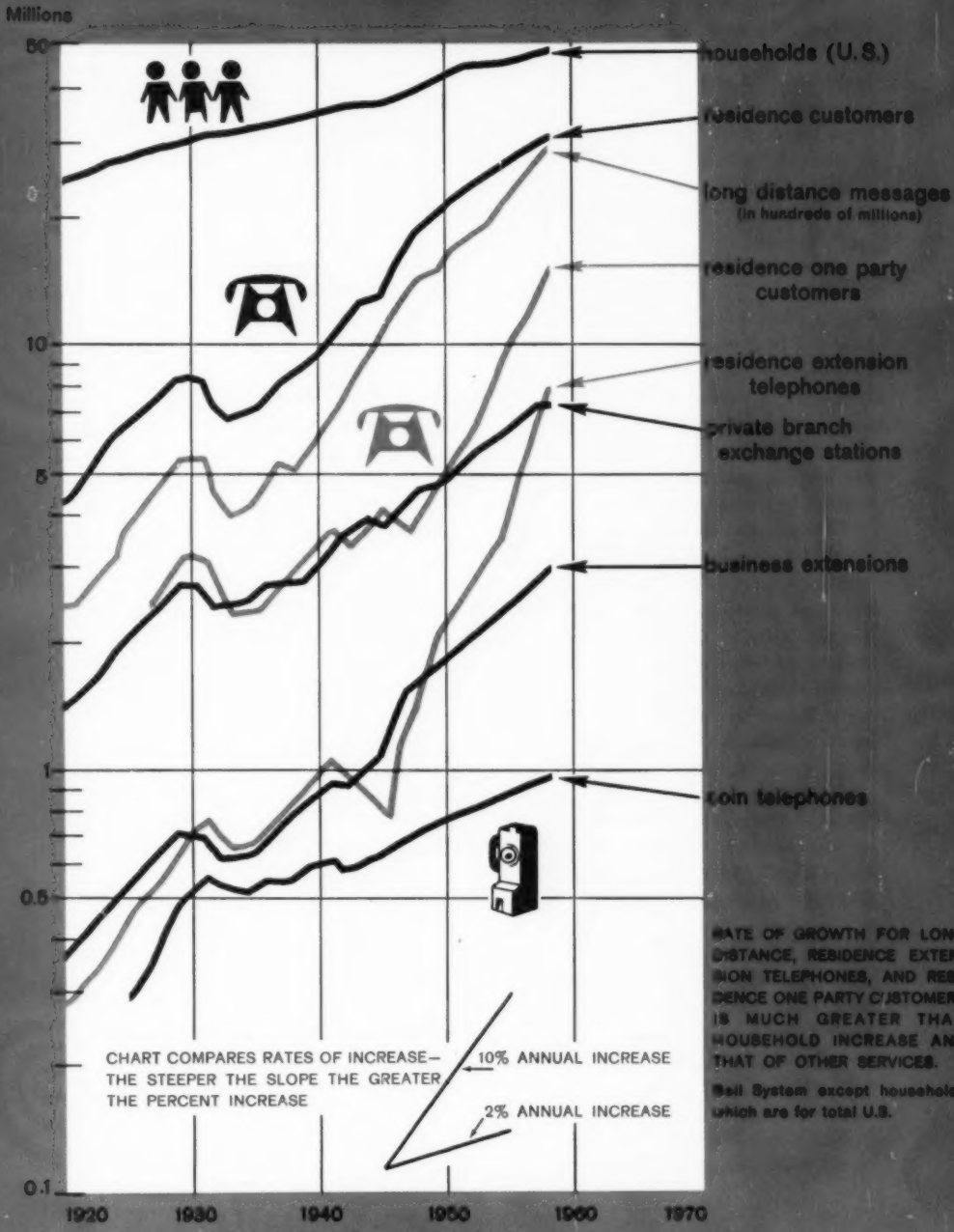
Rising income and a favorable price have produced significant potentials in which several other items the System sells are also going quite well; that is, they are growing faster than households and faster than our other services. The chart shows them clearly. They are residence one-party service, residence extensions, and long distance messages (many services sold predominantly to businesses are not shown – and are not discussed in this article).

The first of these, residence one-party service, is our best seller – next to main service – in terms of proportion of prospective customers already sold. Approximately one half of the residence subscribers have it. At the current rate of growth this would be 100% before 1970, although this rate will almost certainly slow down before then. In either event the end of growth through penetration of this market is also already in sight. However, providing lines to bring this about will be one of the dominant factors in System growth in the sixties. Since 1953 selling higher grades of service has caused System line increase to be greater than main station increase. And it has kept the annual amount of line increase from being affected by business fluctuations, unlike main station increase.

Flexibility Needed

The depletion of this market may also mean the loss of some flexibility in using our equipment. The recession of 1958 illustrates the advantages of such flexibility very well. As business conditions declined the growth in the number of new customers also declined. Some of the equipment provided for these new customers, of necessity provided in advance of the recession, was used anyway by simply promoting the sale of better grades of service. The

STAR PERFORMERS



RATE OF GROWTH FOR LONG DISTANCE, RESIDENCE EXTENSION TELEPHONES, AND RESIDENCE ONE PARTY CUSTOMERS IS MUCH GREATER THAN HOUSEHOLD INCREASE AND THAT OF OTHER SERVICES.

Bell System except households which are for total U.S.

Data from A. T. & T. Chief Statistician

need for other new services to keep this flexibility is quite apparent.

No such limitations in the size of the market such as we see for main station growth and private line growth are yet apparent for our other two fastest growing services — residence extensions and long distance messages. Additional promotion of each of these markets should bring a ready response since there is no indication that we have reached the limits imposed by what our customers have to spend for these items.

Our success in growing in these markets will be limited only by our ability and willingness to understand them. However, as with most other products, maintaining an increase each year will require more and more skill in finding the best potential market and in presenting our products.

Fortunately, we will not have to depend on these alone for future increases in revenue since other new products are being developed. It is not the intent of this article to discuss these in detail. However, some of the possibilities not already mentioned are home intercoms, special sets for various locations in the home such as the new "Princess," and unlimited calling over greater distances at package prices. All of these and others can be sold to today's and tomorrow's customers — they'll have the income — we must provide the other ingredients.

Planning in the Face of Uncertainty

The trends described here should not be expected to come about in steady, even amounts year to year. They have varied considerably in the past and no doubt will continue to do so. Certainly the business cycles will continue — perhaps at roughly forty-month intervals as they have recently. The projections made here assume that none of these will have the severity of the one of the '30's.

We believe that the future of our business is, to a large extent, in our own hands. This belief should tell us something about forecasting, about looking into the future. It should tell us that the future cannot really be foretold because it is in part the result of an infinite number of individual and group decisions not yet made. And these will be reactions to events just as unforeseen as those in the past. For example, the net increase in the number of households in the U. S. could vary considerably if many of our young people should decide to marry at different ages than they do now.

In all of our planning we must then be aware that something other than what we had anticipated may actually happen. This is one of the risks of our business. This risk we can only minimize — we cannot eliminate it.

Yet we must plan, even in the face of a future full of uncertainty. For to assume that the present will continue — that there will be no change — would be the greatest fallacy of all.

Therefore, we study the past and the present — as our only guide to the most probable occurrences in the future. We then can plan (and replan) according to the risks involved.

It should be a rewarding experience. Albert Guerard, of Stanford University, has said it well: "We work for causes today because we believe that several paths are open. . . . Nothing proves that what did happen was alone possible. . . . This quivering indeterminancy is the very essence of life."*

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*In the introduction to *France, A Modern History*, Copyright by The University of Michigan, Ann Arbor, 1959. Reprinted by permission.

Developing skills by Plant craft training is a complex and continuous job. The foreman is the key to a successful program but line and staff people and the individual craftsman must make their contributions, too

Plant Craft Training Responsibility

Otis F. Peters, Jr., *Plant Training Engineer*
OPERATIONS DEPARTMENT, A. T. & T. CO.

THE NUMBER OF Plant Department craft employees in the Bell System has grown from 55,000 to more than 140,000 since World War II – an increase of 150%. These are the linemen, installers, repairmen, and other craftsmen who construct, install, and maintain the many different kinds of telephone plant.

Training these craftsmen to perform efficiently in their assignments is a tremendous job and a continuous job. It is costly, too. But a training program properly planned and properly administered can more than pay for itself.

Training Objectives

The new craft employee is usually a young man just out of high school—or perhaps he has just completed his military service. In either case, he is entirely unfamiliar with telephone craft work. Since much of this work is specialized in the sense of being peculiar to the telephone industry, we must give him the opportunity to acquire the knowledge and skill required in his particular assignment before he can become productive as a Plant craftsman.

If, for example, the new employee is assigned as an installer, he will have to become familiar with the equipment, materials, and tools used in the installation job. He will have to learn to use and apply the Bell System Practices covering his field of work. His skill will have to be developed in handling the specific tools used in the job. Various installation techniques and methods will have to be learned. He will have to learn to climb poles properly and to understand installation service orders.

Craftsmen are often transferred from one job to another—to fill a vacancy created by a promotion or re-

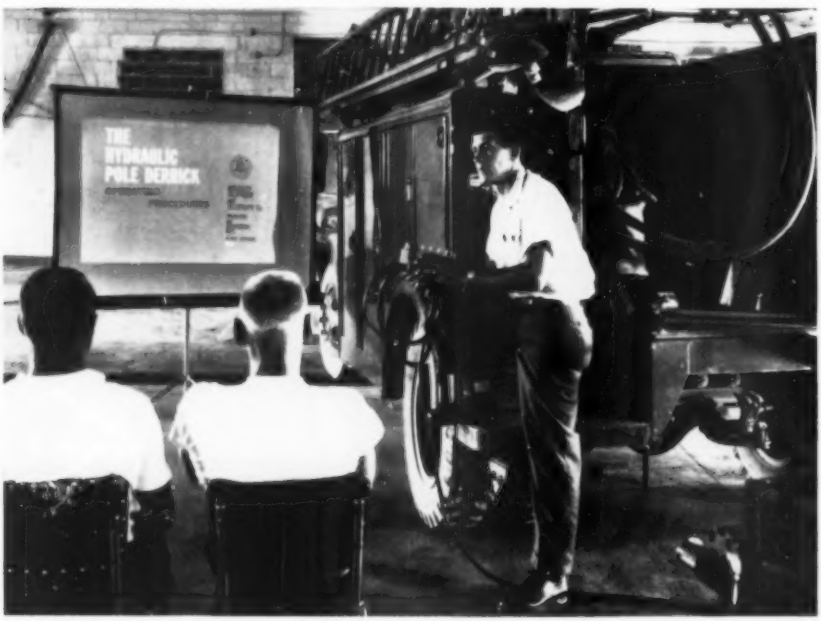
tirement, to balance the force with the work load, or to handle growth in telephone plant. This movement creates many training needs.

In addition to the technical aspects of Plant craft work, other subjects are given consideration in training new employees and those transferred to new assignments. Included are safety, customer relations, public relations, and sales. Training in these related subjects is usually covered in associated craft technical courses, e.g., safety in a pole climbing course, customer relations and sales in a station installation course.

Keeping Step With Technical Progress

Training craftsmen to construct, install, and maintain new telephone instrumentalities is a continuous activity. Today, technical progress and innovation are greater factors in the growth of the telephone industry than ever before. During the past several years we have seen many additions to the family of telephone instrumentalities. To name only a few: Direct Distance Dialing (DDD) central office equipment, P-1 Carrier and TJ Microwave equipments, No. 28 Teletypewriter, 756A PBX, 6A Key Telephone Equipment and the Call-Director Set.

Other instrumentalities are now being developed for introduction into the telephone system in the near future. Some of these are: The TH Microwave System, the No. 300 Switching System developed for the Federal Aviation Agency, the new Line Concentrator, the Electronic



Foreman *conducts an on-the-job training session in a garage. The objective is to help in the development of every man into a fully productive, competent craftsman.*

Learning while doing *helps develop basic knowledge and skills taught in Plant school. Here a foreman instructs a craftsman on the correct way to climb a stepped pole.*

PBX and Electronic Central Office.

Prior to the first installation of a new instrumentality in an area, the foreman and craftsmen involved are given an opportunity to become familiar with the equipment. The successful introduction of the instrumentality depends to a large extent on well trained foremen and craftsmen.

Training foremen and craftsmen in new work methods is also continuous. Improvement in telephone service or economy in work performance is often made possible through the adoption of new work methods or tools. A good example of this is the evolution of the eight or ten-man line crew of several decades ago into the efficient small line crew of today. This transition was made possible because much of the laborious work is now being lightened by power driven tools.

Thus the objectives of a well organized and effectively administered training program are as follows:

1. Training craftsmen to perform efficiently in new work assignments.
2. Training craftsmen in the technical aspects of new telephone instrumentalities.
3. Training craftsmen in the introduction of new work methods.

Training Methods

An effective and economical craft training program makes use of two training methods. They depend upon each other – coordination and balance between the two is essential. They are:

1. Off-the-Job Craft Training—This method is carried out in a Plant school classroom or laboratory

by the Plant instructor.

2. On-the-Job Craft Training — As the name implies, this is carried out on the job by the foreman.

Plant school courses include the basic knowledge and skill required to do a specific craft job. However, in the interest of economy, only the fundamentals necessary to do the job are included—all items of an "it would be nice to know" variety are omitted. The courses are realistic and make use of the learn-by-doing teaching technique whenever it is practicable to do so.

Bell System Practices and drawings are used as text material for Plant school courses whenever possible. These are the materials the craftsman should become familiar with—he will have to use them on the job. The number of craftsmen in each Plant school course and the time schedule for the course are somewhat flexible so as to effectively meet the requirements of the particular training situation.

The objective of Plant school training is to provide a firm foundation for the development of fully competent craftsmen.

Planned on-the-job training is used to increase the basic knowledge and skills taught in Plant school. The on-the-job training method is also used to provide craftsmen with an opportunity to obtain the necessary knowledge and skills in subjects not covered in school. This usually includes training that from a practical viewpoint can best be accomplished in a series of short sessions.

On-the-job training has many forms. A craftsman may be assigned to a particular type of work to give him an opportunity to learn by experience. The foreman may train a craftsman while working with him on a case of trouble or he may plan a session of instruction—in the central office equipment room, or perhaps in the storeroom or garage. Whenever possible, this training is tailored to meet the specific needs of the individual.

The objective of on-the-job training is the development of every man into a productive competent craftsman—in other words, to help him achieve his maximum potential.

Planning *a key-telephone installation job with foreman's help is typical assignment for craftsman who has recently finished school.*

Training Responsibility

The responsibility for training Plant craftsmen falls upon three groups of people. Each of the three must accept its share of the responsibility if the training program is to be successful. They are:

1. The line organization—The foreman is the key man in the craft training program.
2. The staff organization — The Plant training supervisor must

plan and supervise the classroom craft training.

3. The individual craftsman — He must take full advantage of Plant school and on-the-job training opportunities.

It is a line organization responsibility to determine the training requirements of the Plant force to meet the demands of the job. It is also a line responsibility to plan the over-all craft training program to meet these requirements — to decide what part of the training can best be done on the job, and what part of the training should be handled by the Plant school. Periodic appraisal of the training program by the second, third, and fourth levels of line supervision is of continuing importance.

The foreman is the member of the line organization who is in the best position to determine the specific technical requirements of his force. To him, craft training is not just a "one-time" activity. The training and development of the craftsmen in his group requires constant attention and instruction. In order to fulfill this responsibility, the foreman has to be trained when new instrumentalities or new work methods are introduced. He is also given an opportunity to become familiar with teaching techniques to help him in his on-the-job training.

Developing Maximum Potential

As a means of helping every man to attain peak performance in his present assignment, the foreman has to determine the over-all training requirements of his force and the specific training needs of each individual. He then must arrange for appropriate Plant school training and plan his own on-the-job program.

Teachers are taught. *This group of foremen is attending a course in the fundamentals of vocational teaching in preparation for their assignments as Plant school instructors.*

Plant School *in session. The craftsmen above are attending Plant school in temporary quarters at an equipment location. The subject being taught is Crossbar maintenance.*

Thus it is the foreman who initiates the requests for Plant school training for the men in his group. However, before scheduling a craftsman to attend a Plant school, the foreman must be sure he is qualified in the course prerequisites so that he can take full advantage of the training. After a craftsman has completed a course the foreman follows through by providing the job experience that will permit him to make use of and further develop his new knowledge and skill. The participation of craftsmen in Plant school courses does not relieve the foreman of his over-all training responsibility.

In planning the training for his force the foreman must be alert so as not to "train for training's sake." Time spent by craftsmen in training will be wasted unless the knowledge and skill learned are needed—and put to use.

Another responsibility of the foreman is to motivate each man in his force to take a personal interest in self-development.

The responsibility of the staff organization in Plant craft training is to establish and administer Plant schools. At the present time there are more than 200 Plant schools throughout the Bell System. They vary in size from several to more than 20 classrooms. All in all, it is a sizable activity. Last year more than 6,000,000 craft hours were spent in classroom training. The courses taught ran from basic or prerequisite subjects such as electricity and electronics, through station installation and maintenance, all the way to Crossbar central office maintenance. The training courses varied in length from one day to more than 20 weeks. This time could be equated to a trade school with a full-time enrollment of

more than 5,000 students and a staff of over 800 instructors.

It is the Plant training supervisor who is responsible for carrying out the staff organization activity in connection with craft training. He maintains close liaison with the line organization and counsels with them concerning their requests for training — discussing such things as course content, course prerequisites, and time schedules. He then works the line organization requests for training into a Plant school program. It is also his responsibility to provide adequate classroom facilities and suitable training material including the course outlines for the instructors.

Planning the Courses

Careful study is required to determine the proper content for a course. When an instructor's outline is to be prepared the staff methods people are consulted on course content. Plant training courses are designed on a prerequisite or "building block" arrangement, e.g., the completion of a station installation course or the equivalent in on-the-job training and experience would be a prerequisite for a key-station installation course and a knowledge of basic electronics would be a prerequisite for a microwave maintenance course. This results in the reduction of costly duplication in training hours by having all craftsmen in a particular class start the course on a comparable basis.

Still another responsibility of the Plant training supervisor is to provide suitable training material and training aids to help the foreman in his planned on-the-job training activity. For example: a "do-it-yourself" flip-chart training course in central office frame work, or a short film-strip training course on the use and care of a hydraulic pole derrick.

Adequate classroom facilities and good course material are necessary factors in conducting an efficient Plant school operation. However, the degree of success obtained depends to a large extent on the Plant instructor. One of the most important functions of the staff organization in the area of Plant craft training is to select and train competent personnel as instructors. In this connection, it is essential that the line organization give full cooperation by providing them with well qualified candidates.

Plant instructors are usually regular foremen rotated through a school assignment. This has several advantages. First, the experience they bring to the school is invaluable in keeping training realistic. Second, it provides an

New products, *such as the Call Director sets shown above, are given careful study by both the new and experienced craftsmen.*

excellent opportunity to give additional technical training to the foreman.

A continuing job of the Plant training supervisor is the evaluation of training. This is desirable so that appropriate changes can be made in course content, course time schedules, etc. Although training evaluation in general is a somewhat nebulous subject, there is much that can be done to assess what has been accomplished in a course. Some of the methods of evaluation used are: skill demonstration, written examinations, student questionnaires, classroom monitoring, and field follow-up interviews.

The individual craftsman has a very definite area of responsibility for his own growth and development. Both are necessary to qualify him for advancement. The degree of personal satisfaction that he attains in his assignment often depends on how competent he is in performing his work. In fulfilling his responsibility he must take full advantage of training opportunities in school and on the job. He should also seek additional opportunity for self-development. This can be accomplished in many ways — from selective reading to participation in correspondence courses, or attendance at evening school classes.

All in all, teamwork is probably the most essential ingredient of the Plant training job. If a program is to be fully successful and economically administered all the individuals and organizations concerned — including, of course, each individual craftsman — must do their part. There is no better way of assuring that craft training will continue to pay dividends in terms of improved work efficiency.

Classrooms *for a Plant school are located in this manual central office building that has been converted for training craftsmen.*

Who's Who & What's What In This Issue

James W. Heckman

JAMES W. HECKMAN, author of "Comparable Earnings" the report on the conclusions of the Earnings Task Force that appears on page 4, started his Bell System career in the Accounting Department of The Mountain States Telephone and Telegraph Company in 1934. His first job was revenue accounting clerk. The following year he became a traveling auditor, and in 1940 an accounting supervisor at El Paso, Texas. He was appointed revenue accountant in El Paso in 1943, and general revenue supervisor in Denver in 1947. In 1952 he was made general manager for Idaho; in 1956, vice president. He came to A. T. & T. in 1958 as assistant treasurer, financial division, and moved over to his present post of assistant vice president, Administration-R, in January of this year. Mr. Heckman has been engaged in rate matters ever since he became general manager back in Idaho.

THE APPARENT DISPARITY between helping to interest department stores in telephone shopping ("The Greatest Business Getter of Them All," page 11) and working on a telephone line gang is not really as great as it would appear to be at first glance. As proof, the latter was author ROBERT E. JOHNSON'S occupation during college summer vacations and the first of several assignments with the Plant Department of the Indiana Bell Telephone Company. Wartime service in the Signal Corps—substantially all on radio and radar activity—fitted the then Major Johnson for an assignment in the radio engineering section of the O. & E. Department immediately after the war. After several other Engineering Department assignments he joined the Bell Laboratories at the start of the Korean episode to assist in improving the air defense system of the United States. Following this, he returned to O. & E. to work on microwave radio systems. During October, 1954, he was transferred to the sales section at "195" to assist the Associated Companies in selling mobile radio and to handle airline accounts. Other types of accounts —power companies, pipe lines, railroads, then industry studies of various

Robert E. Johnson

types—were gradually added to his responsibilities. With the recent emphasis on still further improvement of Bell System services to such major accounts, Mr. Johnson was appointed to his current position of administrator major account sales in July of this year. He brings to this assignment a knowledge of phases of the business helpful in dealing with customers whose operations are very wide in scope.

Yale Brozen

YALE BROZEN, author of "The Future of Our Economy" (page 21), holds an appointment as professor of economics in the School of Business of the University of Chicago. He is a conference leader in the Senior Bell System Executive Conference, serves as director of the Air Research and Development Command management program, and as director of faculty research. In addition to his duties at the University of Chicago, Professor Brozen is consultant to the Foreign Service Institute of the U. S. Department of State. He was trained as a chemical engineer at the Massachusetts Institute of Technology and studied economics at the University of Chicago, where he received his doctor's degree. Prior to his present professorship, Professor Brozen has held other important appointments in economics and social sciences at other leading universities. During World War II he served as training administrator of the U. S. Army Signal Corps radar training program in the VI Corps area. He is the author of *Workbook for Economics*, a text widely used in the United States and abroad and has served as economic consultant to business organizations and to governmental and private research agencies. In 1949, as a consultant to the Social Science Research Council's Committee on the Social Implications of Atomic Energy and Technological Change, he wrote a research planning report which has been issued under the title *Social Implications of Technological Change*.

THE ARTICLE describing the impressive potential of the DATA-PHONE (page 33) represents JOHN H. CRAIG's first contribution to this magazine. His enthusiasm for this new service concept stems from his broad experience with the DATA-PHONE as private line and TWX engineer in the A. T. & T. Engi-

John H. Craig

neering Department – an assignment he has held since he first came with A. T. & T. in May, 1958. Prior to that he had 19 years experience in the Bell Laboratories in a wide variety of assignments including development work on toll transmission equipment and the engineering of both local and toll switching systems. For several years preceding his transfer to A. T. & T. he was a sub-department head in charge of systems engineering work on station and audio announcement systems. At that time he was especially concerned with SAGE voice communications and air traffic control problems.

J. Robert Talbott

AUTHOR OF "Planning for the Sixties" (page 40), J. ROBERT TALBOTT began his Bell System career with the Chesapeake and Potomac Telephone Company of West Virginia as did Otis F. Peters, Jr., also a contributor to this issue. Mr. Talbott's first job when he started in 1947 was staff assistant in the commercial engineering organization. "My first day with the Bell System began by association with forecasting," he says. "It's a hazardous occupation and I didn't think I'd last very long. However, as this article indicates, I'm still around—and still making forecasts!" Mr. Talbott became manager, Fairmont, West Virginia, in 1949. In 1954 he went on to new experiences as West Virginia market and development engineer. Since 1956 he has been an engineer in the development group, Operations Department, A. T. & T.

YEARS OF EXPERIENCE in training have made OTIS F. PETERS, JR. a logical author of the article on "Plant Craft Training Responsibility" (page 51). For the past three years he has been plant training engineer in A. T. & T. Earlier in his career he was general plant personnel supervisor in the Chesapeake and Potomac Telephone Company of West Virginia. This job, too, carried responsibility for plant training. Mr. Peters started with what was then the Chesapeake and Potomac Telephone Company of Baltimore City as a splicer's helper in 1936. A variety of craft and management jobs in plant and commercial followed. In 1951 he moved to the West Virginia Company where his assignments included district plant manager, general plant supervisor and division plant manager.

Otis F. Peters, Jr.

HEADQUARTERS SUMMARY

THE FIRST TRANSATLANTIC telephone cable system to link North America directly with the mainland of Europe was inaugurated and opened to public service on September 22. A $40,000,000 project, it was undertaken by the A. T. & T. Company, the French Ministry of Posts and Telecommunications, and the West German Ministry for Posts and Telecommunications. In addition, four other European countries – Belgium, Italy, the Netherlands, and Switzerland – have taken circuits in the cable.

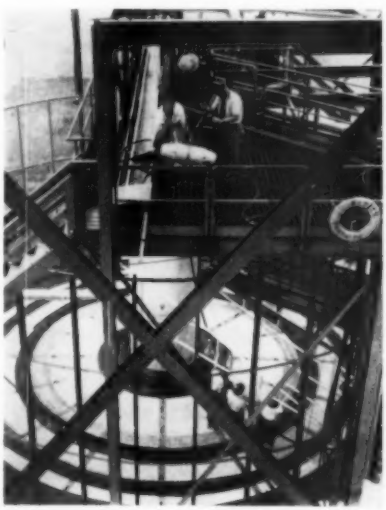
The inaugural call, which was as clear as a conversation across town, connected communications officials in New York and dignitaries in Paris. These included Frederick R. Kappel, President of A. T. & T.; Vice President Henry T. Killingsworth, of Long Lines; and John C. Doerfer, Chairman of the Federal Communications Commission. Speaking from Paris were Bernard Cornut-Gentille, the Minister of Posts and Telecommunications, and Raymond Croze, Director General of Telecommunications, Republic of France; Richard Stuecklen, Minister of Posts and Telecommunications, and Dr. Friedrich Gladenbeck, State Secretary in the Ministry of Posts and Telecommunications, Federal Republic of Germany. These individuals paid tribute to the many people on both sides of the Atlantic who worked for two years without let-up to make possible the opening of the system on schedule.

At the end of the first month of the cable's operation traffic to the countries involved was about 25 per cent higher than during the weeks immediately prior to the cutover.

Inaugural *Call on the new transatlantic cable*

THE SYSTEM'S construction expenditures this year are expected to total about $2¼ billion, or slightly more than in 1958. About two-thirds of these requirements will be met by depreciation accruals, retained earnings, and employees' stock plan installments. The balance will be provided through the sale of securities and by drawing upon cash and temporary investments.

Debt issues totaling $450 million have already been sold or scheduled, including an A. T. & T. $250 million issue of debentures to be offered at competitive bidding on November 17th.



The Fantastic – *a cable ship on a hilltop*

TWENTY-EIGHT MILES inland in Chester, New Jersey, the Bell Laboratories has a "cable ship" in the final stages of construction. Named the *Fantastic* the laboratory "ship" is firmly anchored to a hilltop. Actually a model of the cable tanks

and working decks of a cable laying vessel, its purpose is to aid Bell Laboratories engineers to carry out the most extensive modernization of cable ship equipment and techniques since the first telegraph cables were laid a century ago. The changes are needed to handle improved underwater telephone cable systems now being planned.

A BELL SYSTEM LIVE MUSICAL show called "Cash on your Line" was presented at the recent annual convention of the Florists' Telegraph Delivery Association in Los Angeles. Complete with orchestra, singers and dancers, and starring Stubby Kaye of Broadway, movie and television fame, the hour-long show was received with enthusiasm by the 1500 florists who saw it. Its purpose: To show how maximum telephone usage – Yellow Pages, local and long distance–can give florists more sales and profits.

Florists represent a big market for selling telephone usage and Yellow Pages advertising. There are 25,000 florists in the United States and it is estimated that they receive 90% of their local orders by telephone. They handle about 12 million intercity orders a year, 60% of which are transmitted by long distance telephone.

WESTERN ELECTRIC's substantial buildup in production of the Call Director, combined with a good sales administration job by the Operating Companies while they were in short supply, permitted all sales limitations to be removed in August.

Sales of the Call Director during the early part of this year ran so far ahead of the Companies' estimates that it was necessary temporarily to slow down Company-initiated contacts and adopt sales limits until production could be brought up to demand.

Production now supports unlimited selling. Western Electric expects to ship 70,000 Call Director telephones this year –up from an initial program of 18,000.

THE TRIANGLE which for 48 years has symbolized the three principal aims of the Pioneers–Fellowship, Loyalty and Service–was recently registered as a "collective membership mark" in the United States Patent Office.

Under the Federal registration law, no organization other than the various units of the Telephone Pioneers of America has the right to use the emblem, either in identical or similar form.

THE NUMBER OF FIRES on telephone company premises and the losses incurred during 1958 were significantly less than the previous year. Reported fires totaled 191 and estimated losses $125,000 as compared to 242 fires and $143,000 in losses during 1957. Fires in central office equipment and in building electrical and mechanical equipment were the largest in number and in damage. Fires due to smoking continue high.

BUILT-IN TELEPHONE panels may soon become the latest thing in modern kitchens, eliminating the wall-set placement problem in cabinet lined kitchens. Trial telephone panels are being installed directly in kitchen walls and also in kitchen cabinets specifically designed to accommodate them. 300 such panels are going in new homes being built in and around Baltimore, Maryland.

MORE THAN 67,000 Bell System employees elected to purchase more than 950,000 shares of A. T. & T. stock in response to the 1959 offering under the Employees' Stock Plan. Monthly payroll allotments for these shares began in July and will total approximately $2,800,000.

THE NEW YORK Company completed the third step of a five-step program to provide nationwide dialing for all Panel and No. 1 Crossbar offices in New York City in September. This third step involved seven buildings and 301,000 more main telephones in Brooklyn and Queens.

Approximately 1¾ million main telephones in Panel and No. 1 Crossbar offices in New York City now have access to DDD. The entire project, which began last February, will be completed in 1960.

The Blue Pencil

Judson S. Bradley

THIS IS THE FIRST issue of this magazine in 16 years of which Judson S. Bradley has not been the editor. To those among his friends who do not already know the reason for this, we are sorry to report that Jud Bradley has been ill. He suffered a mild stroke late last spring and has been on sickness absence since that time. We hasten to add that he has recovered to the point of being up and around his apartment and of taking daily walks about the lower Fifth Avenue area of Manhattan, where he lives. His jovial good humor, cheerful view of life and courtly manner have in no way diminished. Just as we go to press we learn that Jud has purchased a home amid the colonial charm of Old Lyme, Connecticut, where the "editor emeritus" and Mrs. Bradley will shortly be pursuing their many interests.

His innumerable friends and the host of readers to whom the Bell Telephone Magazine and Judson S. Bradley were synonymous will undoubtedly find it hard to get used to the fact the two have thus become separated. To them let it be said that Jud's vast enthusiasm for this publication, his deep conviction of its present value and of its great potential are held in equal measure by the publication's present editor. The incumbent also shares Jud's belief that a magazine, to be successful, must ceaselessly develop and grow. Like a business—or an individual—a publication cannot long stand still without slipping backward. Indeed, just before his illness Jud had prepared an exhibit showing how this publication had evolved through the years.

There will be evolutionary changes in the issues to come. But the fundamental philosophy from which this magazine naturally springs and takes its being will not change. It will continue, in the words set forth on the title page of this issue, to concern itself with giving "Bell System management people a broader view of the history, objectives, operations and achievements of this business than they might attain in the course of their day-to-day occupations, and an added sense of participation in the problems and accomplishments of our nation-wide public service."

Any and all changes, then, that occur on these pages will be designed to further these ends. It is our objective to tell the continuing "Bell System story" as clearly, as interestingly, as informatively as the resources at our command permit. In doing so we shall have a truly dramatic story to tell. We will be holding a mirror to an *exciting* industry—an industry that is an established leader in the technology of these swiftly paced times; one that, despite the many years since its founding, stays young in thought and action because of the vigor, the resourcefulness, the dedication of its people.

The effectiveness of this magazine can be measured in only one way—in its usefulness to all Bell System management people everywhere. It is our special aim, therefore, to make it more and more effective as a "tool" which gives these people the perspective on the System's policies, problems, objectives and accomplishments that is so important to them in their present assignments and as background for the greater responsibilities that may come later.

We hope you will like the *Bell Telephone Magazine* of the future. We hope J.S.B. will like it, too.

BELL SYSTEM TEAMWORK IS A VITAL FACTOR IN EFFICIENT, ECONOMICAL TELEPHONE SERVICE

Direct Distance Dialing is an example of the value of unified research, manufacture and operations

There are great advantages to the public and the nation in the way the Bell System is set up to provide telephone service. It is a very simple form of organization, with four essential parts.

Bell Telephone Laboratories does the research.

The Western Electric Company is the Bell System unit which does manufacturing, handles supply, and installs central office equipment.

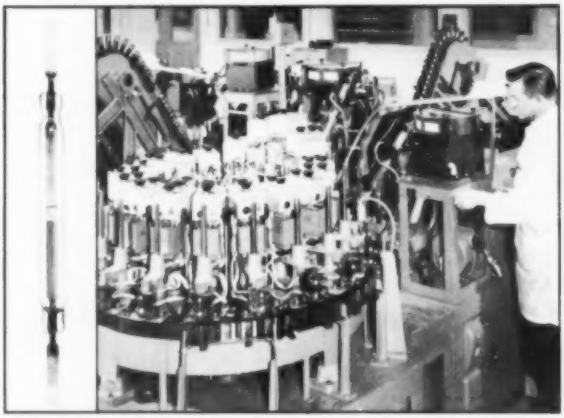
Twenty-one Bell Telephone operating companies provide service within their respective territories.

The American Telephone and Telegraph Company co-ordinates the whole enterprise and furnishes nationwide service over Long Distance lines.

Each is experienced and efficient in its own field. But the particular value of each is greatly extended because all four parts are in one organization and work together as a team.

Direct Distance Dialing—one of the greatest advances in the speed and convenience of telephone service—is an example of the value of this unified setup.

Already more than 8,000,000 telephone customers in more than 700 localities can dial direct to as many as 46,000,000 telephones throughout the country. Each month there are more. Millions of others can dial direct over shorter out-of-town distances. Calls as far as 3000 miles away go through in seconds.



EXAMPLE OF TEAMWORK. At left is new fast-moving switch (actual size) used in Direct Distance Dialing. Many of them go into action automatically every time you dial. Enclosed in gas-filled glass tubes to assure perfect contacts. Made to last 40 years. The result of Bell Telephone Laboratories and Western Electric working together to get the best and most economical design. At right is remarkable new machine, designed by Western Electric, which automatically assembles 360 switches an hour at a very small cost.

All of this didn't just happen. It called for years of intensive planning, the invention of wholly new machines and equipment, and the development of new operating and accounting techniques.

Research alone couldn't have done it. Neither manufacturing nor operations separately could have done it. And just money couldn't have done it, although it takes money and a lot of it for telephone improvement.

The simple truth is that it could never have been done so quickly and so economically without the unified setup of the Bell System.

For many a year it has given dynamic drive and direction to the business and provided the most and the best telephone service in the world.

BELL TELEPHONE SYSTEM

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